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A CROSS-CUTTING ANALYSIS OF AGRICULTURAL RESEARCH, EXTENSION, AND EDUCATION (AG REE) IN AID-ASSISTED LAC COUNTRIES

VOLUME ONE: TECHNICAL REPORT

by

Kerry J. Byrnes

Submitted to:

U.S. Agency for International Development
Bureau for Latin America and the Caribbean
Office of Development Resources
Rural Development Division
LAC/DR/RD

February 1992

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[1]The ideas expressed herein do not necessarily represent the views or policies of the U.S. Agency for International Development (USAID) or Chemonics International. Any errors are the sole responsibility of the author.

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EXECUTIVE SUMMARY

The Agency for International Development (AID) has helped strengthen agricultural research, extension, and education (Ag REE) systems in the Latin American and Caribbean (LAC) region since the early 1950s. Despite successes in building public Ag REE institutions between the 1950s and 1970s, the region's technology generation and transfer (TG&T) capacity deteriorated significantly during the 1980s, weakening agriculture's capacity to contribute to food security, trade, and economic growth in the region. To reverse this trend, a "demand-driven" (market-led) TG&T process needs to be created. Potential assistance options for fostering emergence of "demand-driven" Ag REE systems include:

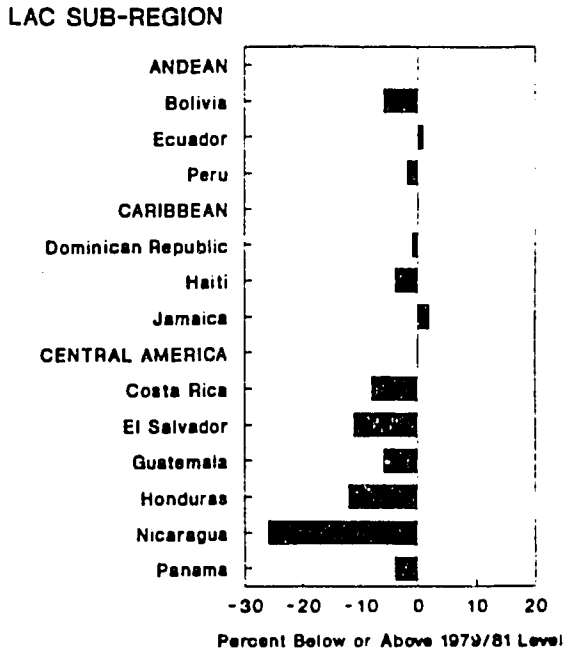
- Prioritizing Ag REE in the LAC Bureau's Agriculture and Natural Resources strategy;
- Reorienting existing and planned projects to adhere more closely to guidelines for Ag REE-strengthening;
- Ensuring balanced AID support for international, regional, and national agricultural research systems;
- Providing appropriate technical support through existing or new projects or funding mechanisms; and
- Organizing development assistance programming for Ag REE in terms of sub-regional programs.

CONTINUING FOOD INSECURITY

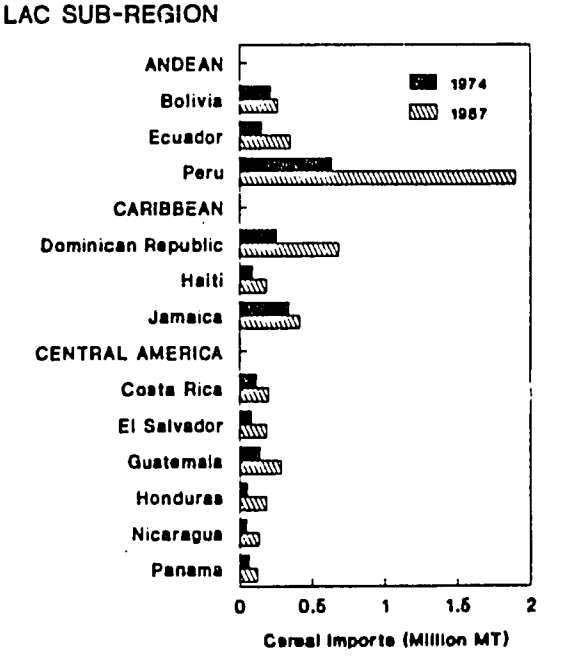
AID assistance in the LAC region aims at broad-based, sustainable economic growth that provides for improved food security. Yet the two basic requirements for food security are not being met in AID-assisted LAC countries: (1) total food supply is still not adequate in a number of countries to provide sufficient calories to all of the population, even if the total supply were divided equally; and (2) poor households do not produce or cannot afford to buy enough food to enable their members to lead active and healthy lives.

Increases in food availability have lagged in comparison with growth in national incomes. This chronic food insecurity is the result of low agricultural productivity. Poor labor and land productivity result in low levels of food supplies, limited marketing of surplus food, and cash incomes insufficient to stimulate demand for additional farm and non-farm goods and services. Further, most AID-assisted LAC countries during the 1980s experienced both a decline in per capita food production (Box 1) and a growth in cereal imports (Box 2).

Box 1. 1987 Per Capita Food Production
AID-Assisted LAC Countries



Box 2. Growth in Cereal Imports
AID-Assisted LAC Countries



AGRICULTURAL PRODUCTIVITY DECLINING

Broad-based, sustainable economic growth depends on creating a macroeconomic and policy environment conducive to investing in agriculture. It also depends on: (1) generating productivity-increasing technologies that are responsive to market opportunities, farmer production, and marketing constraints, and (2) farmers' willingness and ability to adopt these technologies.

The paramount function of a country's Ag REE system, including public and/or private components, is to generate and transfer the agricultural technology essential for increasing agricultural productivity and agriculture's contribution to economic growth. The Ag REE system also helps develop the human resources needed in the agricultural sector.

Despite the potential importance of TG&T to economic growth in the LAC region, public sector investment in Ag REE in the region declined significantly during the 1980s. Declines in host-country public funding for agricultural research were paralleled by declines in AID funding for Ag REE. In FY84-FY91, LAC Mission Agricultural, Rural Development, and Nutrition (ARDN) funding for Ag REE declined both absolutely and as a percentage of total ARDN funding (Box 3).

Box 3. Ag REE Funding as a Percentage of Total LAC ARDN Funding.

	FY	RES	EXT	EDU
Andean:				
	88	16.3	15.9	4.0
	89	26.6	28.9	6.0
	90	12.3	16.9	1.4
	91	2.7	4.0	0.3
Caribbean:				
	88	8.3	17.4	0.0
	89	10.4	20.0	5.8
	90	23.2	17.9	6.1
	91	24.7	21.3	3.9
Central America:				
	88	15.6	10.3	5.5
	89	3.6	7.7	10.3
	90	3.6	4.5	0.9
	91	0.5	2.4	0.8

These declines have made it more difficult for public A REE systems to reverse the deterioration in the region' food production capability and agriculture's contributio to economic growth. Further, unfavorable terms c trade have provided no incentive for investment in agr culture or for farmers to seek alternative productivity increasing technologies. Even in countries where AI has helped to establish a more favorable macroeconomi and policy environment (e.g., Bolivia), weakened A REE systems cannot respond vigorously to the improve environment.

TG&T CAPACITY DETERIORATING

To provide an up-to-date assessment of the status of A REE systems in AID-assisted LAC countries, AI conducted a survey of its LAC Missions. Mission sur vey responses reflected the limited progress and fre quent inadequacies of public sector Ag REE systems a well as numerous constraints impeding greater syster productivity.

Mission ratings of progress in strengthening selected A REE system attributes indicated that progress has bee greatest for private sector TG&T. By comparsion, th progress ratings for public sector Ag REE system attr butes were consistently lower, with public sector agr cultural research and extension receiving below averag ratings and agricultural education, on average, rate lower than the other three categories.

Generally, the Missions rated the adequacy of selecte public sector Ag REE system attributes (personnel mar agement, program planning, and budgeting) as "poor to "very poor," although numbers of persons trained fc public research and extension fared somewhat better.

The following constraints to Ag REE-strengthening wer identified from the survey responses:

- The primary constraint is client-country factors (e.g weak public sector);
- The secondary constraint is AID policy directive (e.g., export-led development strategy); and
- The tertiary constraint is Mission inadequacies (e.g Mission lacks adequate staff to deal with Ag REE)

There was a marked tendency by Missions not to ra *lack of demand* for technology as a constraint. Th suggests that Missions perceive *lack of supply* of tec nology (or its transfer to farmers), not lack of deman as the primary constraint.

TRENDS IN AG REE-STRENGTHENING

In the 1980s, AID strategy in the LAC region moved from support for institution building of public Ag REE systems, toward institution building of private sector systems (e.g., agricultural research foundations).

The changing institutional focus of AID assistance was also accompanied by changing commodity priorities, as AID turned from traditional food crops to nontraditional agricultural export (NTAE) crops.

While several Missions are developing projects with Ag REE components, Mission responses to the survey did not evidence that Ag REE strengthening is an integral part of Agency strategy. Also, an appraisal of the Ag REE-strengthening efforts of other donors and development assistance agencies (e.g., World Bank and ISNAR) reflects that Ag REE-strengthening in AID-assisted LAC countries is not a high priority. Finally, while several International Agricultural Research Centers (IARCs) are located in the LAC region, the IARC mandate does not include strengthening national-level agricultural research, extension, and education systems.

Too often AID has relied on a "supply-oriented" approach aimed at strengthening the ability of Ag REE organizations to carry out TG&T, without adequate attention to the basic macroeconomic, policy, and institutional disincentives to investment in agriculture and productivity-increasing technology. This, in turn, constrains the value of developing productive TG&T capability in public and/or private Ag REE systems.

By the time the LAC region turned its attention to macroeconomic and policy constraints to economic growth in agriculture, AID assistance for public Ag REE institution building was being or had been terminated. In the process, AID overlooked the lesson learned that strengthening TG&T capability is a long-term process of human resource development and institution building that must include collaboration and support of both public and private sectors.

RECOMMENDATIONS

To reverse the deterioration in the TG&T capacity of AID-assisted LAC countries, the client countries and the Agency need to begin to identify ways to facilitate the emergence of demand-driven (market-led) TG&T in the region's Ag REE systems. Potential assistance options for fostering emergence of demand-driven Ag REE systems include:

- Setting priorities for Ag REE in the LAC Bureau's Agriculture and Natural Resources strategy
- Including development assistance funding for Ag REE in terms of sub-regional programs
- Ensuring balanced AID support for international, regional, and national agricultural research systems
- Providing appropriate technical support through existing or new projects or funding mechanisms
- Reorienting existing and planned projects to adhere more closely to guidelines for Ag REE-strengthening
- Placing the issue of Ag REE-strengthening on the policy dialogue agenda in AID-assisted LAC countries (e.g., greater autonomy and budget support for agricultural research)

Further, TG&T organizations must develop program selection criteria that include, *inter alia*, the anticipated market environment and the expected costs and benefits of program alternatives, the relative importance of crops, the specific needs and abilities of client groups, and the specific mix of public and private funding that is required for sustaining Ag REE systems.

These recommendations, if adopted by AID, can help to establish the conditions for emergence of demand-driven Ag REE systems in the LAC region. Once these conditions have been created, a more favorable environment will exist for design and implementation of projects focused on strengthening Ag REE. Absent these conditions, it is futile for AID to seek to implement a capacity building approach to Ag REE-strengthening.

The author, Kerry J. Byrnes, is Agricultural Research, Extension, and Education Advisor for the LAC Agriculture and Rural Development Technical Services Project (LAC TECH), Chemonics International. This report was prepared for the U.S. Agency for International Development's Bureau for Latin America and the Caribbean, Office of Development Resources, Rural Development Division (LAC/DR/RD), February 1992.

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AD	Agribusiness Development Project (El Salvador and Guatemala)
ADF	Agricultural Development Foundation (Dominican Republic)
AE	Agricultural Education Project (Ecuador and Jamaica)
Ag REE	Agricultural Research, Extension, and Education
AID	United States Agency for International Development
ANACAFE	National Coffee Association (Guatemala)
AP	Agroforestry Program Project (Haiti)
APENN	Nicaraguan Non-Traditional Agricultural Growers and Exporters Association
ARDN	Agriculture, Rural Development, and Nutrition
AREE	Agricultural Research, Extension, and Education Project (Ecuador)
AST	Agricultural Sector Training Project (Dominican Republic)
ATT	Agricultural Technology Transfer Project (Perú)
BABCO	Belize Agribusiness Company
CAC	Commercialization of Alternative Crops Project (Belize)
CARDI	Caribbean Agricultural Research and Development Institute (Trinidad)
CARE	Caribbean Agricultural Research and Extension Project (RDO/C)
CATIE	Tropical Agricultural Research and Training Center (Costa Rica)
CBGA	Caribbean Basin Growers Association Project (proposed)
CDRA	Agricultural Research and Documentation Center (Haiti)
CENTA	Agricultural Technology Center (El Salvador)
CIAT	International Center for Tropical Agriculture (Colombia)
CIAT/IBTA	Tropical Agricultural Research Center of IBTA (Santa Cruz, Bolivia)
CIMMYT	International Maize and Wheat Improvement Center (Mexico)
CINDE	Costa Rican Coalition of Development Initiatives
CINDE/DIVAGRI	Agricultural Division of CINDE (Costa Rica)
CIP	International Potato Center (Perú)
CRDP	Chapare Regional Development Project (Bolivia)
DESFIL	Development Strategies for Fragile Lands Project (S&T/RD)
DIA	General Directorate of Agricultural Research, MAG (Costa Rica)
DIA/SEA	Department of Agricultural Research of SEA (Dominican Republic)
DOA/RD	Department of Agricultural Research-Research Division (MOA of Belize)
EAP	Pan American Agricultural School (Zamorano) (Honduras)
EARTH	Agricultural School for the Rural Humid Tropics (Costa Rica)
ENA	National School of Agriculture (El Salvador)
FEPADE	Entrepreneurial Foundation for Educational Development (El Salvador)
FHIA	Honduran Agricultural Research Foundation
FPX	Federation of Agricultural and Agroindustrial Producers and Exporters of Honduras
FUNDAGRO	Foundation for Agricultural Development (Ecuador)
FUNDEAGO	Foundation of Agricultural Development (Perú)

FUSADES	Salvadoran Foundation for Economic and Social Development
FUSADES/ DIVAGRO	Agricultural Division of FUSADES (El Salvador)
GEXPRONT	Non-Traditional Products Exporters Association (Guatemala)
GREXPAN	Non-Traditional Agricultural Producers and Exporters Association
HADS	Highlands Agricultural Development Project (Guatemala)
HARF	Honduran Agricultural Research Foundation Project
IARC	International Agricultural Research Center
IBTA	Bolivian Institute of Agricultural Technology
ICTA	Agricultural Science and Technology Institute (Guatemala)
IDB	Inter-American Development Bank
IDIAP	Panamanian Institute of Agricultural Research
IICA	Inter-American Institute for Cooperation on Agriculture (Costa Rica)
INIAA	National Institute for Agricultural and Agro-Industrial Research (Perú)
INIAP	National Institute of Agricultural Research (Ecuador)
IPM	Integrated Pest Management Project (ROCAP)
ISNAR	International Service for National Agricultural Research
ISA	Superior Institute of Agriculture (Dominican Republic)
JACC	Joint Agricultural Coinvestment Council (Dominican Republic)
JADF	Jamaican Agricultural Development Foundation
JARP	Jamaica Agricultural Research Project
JSA	Jamaica School of Agriculture
LAC	Latin America and the Caribbean
LAC/DR/RD	Division of Rural Development, Office of Development Resources, Bureau for Latin America and the Caribbean, AID
LAC TECH	Agriculture and Rural Development Technical Support (ARDTS) Project
LD	Livestock Development Project (Belize)
LUPE	Land Use Productivity Enhancement (Honduras)
MAG	Ministry of Agriculture and Livestock (Nicaragua)
MIDA	Ministry of Agricultural Development (Panamá)
MOA	Ministry of Agriculture (generic)
NARS	National Agricultural Research Systems
NRM	National Resources Management
NTAE	Non-Traditional Agricultural Export (NTAE) Technical Support Project (Costa Rica)
NPSA	Non-Project Sector Assistance (generic)
OFWM	On-Farm Water Management Project (Dominican Republic)
PAO	Private Agricultural Producer Organizations Project (Bolivia)
PNIA	National Program of Agricultural Research (Ministry of Natural Resources, Honduras)
PROEXAG	Non-Traditional Agricultural Export Support Project (Guatemala)
PVO	Private Voluntary Organization (generic)
RAHE	Regional Agricultural Higher Education (ROCAP)
RARC	Regional Agricultural Research Center
RDO/C	Regional Development Office for the Caribbean

ROCAP	Regional Office for Central America and Panamá
RTTS	Rural Technology Transfer Systems Project (Ecuador)
SEA	Secretary of State for Agriculture (MOA of Dominican Republic)
SERA	Agricultural Research Division of the MOA (Haiti)
SRN	Ministry of Natural Resources (Honduras)
TG&T	Technology Generation and Transfer
TROPRO	West Indies Tropical Produce Support Project (RDO/C)
TSP	Technical Support Project (generic)
TWM	Target Watershed Management Project (Haiti)
UNA	National Agrarian University (Perú)
UWI	University of the West Indies (Trinidad)
WM	Water Management Project (El Salvador)

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Various staff persons of LAC/DR/RD provided suggestions for improving the design of the questionnaire for the LAC/DR/RD survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs (Annex C). Audón Trujillo, John Fasullo, Mike Korin, and Gale Rozell provided suggestions for improving the questionnaire. Joanna Bressel, LAC TECH Administrative Assistant, reproduced the questionnaire and sent it by international courier to the 13 LAC USAID Missions.

The staff in the Agriculture and Rural Development Offices of 13 LAC USAID Missions did a great job in completing the lengthy survey questionnaire. Without their input, the cross-cutting analyses (Chapters IV and V) and the country case studies (Annex D) would not have been possible. The key persons in this respect, by Mission, were:

Andean Region

Bolivia:	Darell McIntyre and Jonathan A. Sleeper
Ecuador:	Richard J. Peters, David L. Alverson, Marco Peñaherrera, and Fausto Maldonado
Perú:	Rudolfo R. Griego

Caribbean Region

Dominican Republic:	Kenneth Wiegand
Haiti:	David Atteberry
Jamaica:	Mark Smith, Barbara Eilington-Banks, and Mark Nolan
RDO/C:	Timothy J. Miller

Central American

Belize:	Elizadia Washington, Fred Hunter, and Al Hankins
Costa Rica:	Ross Wherry
El Salvador:	Kenneth C. Ellis
Guatemala:	Roberto Castro
Honduras:	Dwight Steen and D. Craig Anderson
ROCAP	Ronald V. Curtis, Richard L. Hughes, and Jeffrey H. Allen

Albert "Scaff" Brown, LAC TECH agricultural policy advisor, played a key role in providing insight on the history of AID development assistance for agricultural research, extension, and education (Chapter III.A) and in stimulating the discussion in Chapter VI of the concept of a demand-driven Ag REE system. His contributions also are noted in Annex I regarding the possibility of a ROCAP-funded project to support agricultural research and agricultural higher education in Central America.

Gary Hansen of PPC/CDIE/PPE provided information on the endowment mechanism which several AID-assisted LAC countries are seeking to develop as a way to fund agricultural research. Information on the efforts of several USAID Missions to develop endowments is presented in Annex F.

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CHAPTER I
INTRODUCTION

A. Objective of Report

During the 45 plus years since World War II, the U.S. Agency for International Development (AID or USAID) or predecessor agencies have provided funding for development assistance programs to strengthen agricultural research, extension, and/or education (Ag REE) in the Latin America and Caribbean (LAC) region. This report reviews and assesses this development assistance in regard to Ag REE's current status in the LAC region, with the objective of identifying the direction, if any, that AID-funded development assistance should take during the 1990s with respect to the issue of strengthening Ag REE in the LAC region.

B. Organization of Report

The report consists of Volume 1: Technical Report and the accompanying Volume 2: Annexes. In the present volume, Chapters I to V provide a reference resource that the reader may use to review and document the evolution of AID assistance for Ag REE-strengthening in the LAC region. Chapters VI-VII are forward-looking: Chapter VI focuses on the direction that Ag REE-strengthening efforts should take and Chapter VII provides a range of potential assistance options that AID could elect to undertake, moving in the direction indicated in Chapter VI.

The balance of Chapter I, beginning with section C, provides an overview of the current development status of the LAC region, with particular emphasis placed on the degree of poverty characterizing the region, the objectives of AID's Bureau for Latin America and the Caribbean (LAC), and the role of Ag REE-strengthening in addressing these objectives.

Chapter II reviews funding trends from FY84 to FY91 in the AID LAC Agriculture, Rural Development and Nutrition (ARDN) portfolio. The chapter provides: (1) an analysis of trends in AID funding for Ag REE in the LAC region, and (2) an overview of other donor activities vis-à-vis LAC Ag REE-strengthening.

Chapter III identifies the principal variables that have defined the course of evolution during the 1980s of AID strategy and project approaches to Ag REE-strengthening in the LAC region. The discussion is based on analyses of AID documents that provide information on the Ag REE components of ARDN-funded projects of the LAC USAID Missions during the 1980s. This documentation includes project summaries, Logical Frameworks, project evaluations, and Country Development Strategy Statements (CDSSs). Based on these analyses, the major substantive changes in strategy and project approach that occurred during the 1980s are identified. Annex A summarizes the relevant material drawn

from USAID CDSSs, while Annex B provides a summary of the Ag REE components of USAID Mission projects during the 1980s.

Chapter IV provides an analysis of LAC USAID Mission assessments of the status of Ag REE in the LAC region. The analysis is based on Mission responses to an LAC/DR/RD Survey of LAC Mission Ag REE projects/programs. The survey was conducted by LAC/DR/RD's LAC TECH project during the summer of 1990. A copy of the survey questionnaire is provided in Annex C. The survey provided the basis for preparing both Mission-specific case studies (see Annex D) as well as Chapter IV's analysis of Mission assessments of the progress of, adequacy of, and constraints on Ag REE systems in AID-assisted LAC countries. The chapter includes both subregional (Andean, Caribbean, Central American) and cross-cutting analyses of the status of Ag REE in the LAC region. Finally, the chapter summarizes the problems that must be addressed in order to increase the effective impact of development assistance for Ag REE-strengthening in the LAC region.

Chapter V provides a summary of Mission survey responses describing each Mission's own strategy, program, and plans with respect to Ag REE-strengthening in the Mission's host country. Specifically, the chapter reviews each Mission's assessment of trends in Mission funding for Ag REE-strengthening; provides a summary description of current Mission projects having an Ag REE component; indicates whether the Mission Agriculture and Rural Development Office has a program-level monitoring and evaluation system; summarizes the Mission' strategy, if any, for Ag REE-strengthening; identifies key management questions of concern to the Mission with respect to Ag REE-strengthening; notes Mission-identified opportunities that should be pursued by the Mission or by other donors with respect to Ag REE-strengthening; and summarizes the Mission's position, if any, on non-project assistance vis-à-vis Ag REE-strengthening.

Chapter VI focuses on the concept of a demand-driven Ag REE system. The chapter discusses the need for a demand-driven Ag REE system; essential conditions for establishing a demand-driven agricultural technology generation and transfer (TG&T) system; and the research, extension, and education functions essential for carrying out agricultural TG&T within an Ag REE system, albeit public, private, or a combination of these.

Chapter VII provides a range of potential assistance options that AID could elect to facilitate the emergence of a demand-driven Ag REE systems in the LAC region. In effect, the chapter identifies potential ways in which AID become more proactive in helping to ensure that broad-based economic growth in the LAC region is not precluded by a failure to address the need for strengthening the TG&T capacity of the region's Ag REE systems.

C. The Strategic Role of Ag REE-Strengthening

1. Some Measures of Poverty in the LAC Region

As stated in The World Bank (1990) *Poverty* report, the population of the Latin America and Caribbean (LAC) region, as a percent of total world population, held constant at 11% between the 1960-65 and 1988-89 periods. Yet the LAC region's

percentage share of income fell during the same period from 33% to 27%, a decline of nearly 20% (World Bank, 1990:10). In the past 25 years, real per capita GDP growth in the LAC region fell from 3.7% in 1965-73 to 2.6% in 1973-80 and to -0.6% in 1980-89. Real per capita growth was almost -1.0% in the 1980-89 period, with all other regions except sub-Saharan Africa having positive real per capita growth during the same period.

The percentage of the LAC population below the poverty line (set at $370 annual income) is 12% if only the "extremely poor" (50 million) are counted, and rises to 19% if the "poor (including extremely poor)" (70 million) are counted. The rural population, as a percentage of total population, is 59% in Guatemala, 50% in Panamá, and 44% in Perú, while the rural poor as a percentage of total population for these same countries is 66%, 59%, and 52%, respectively (World Bank, 1990:31). As the World Bank notes:

> Poverty as measured by low income tends to be at its worst in rural areas, even allowing for the often substantial differences in cost of living between town and countryside...malnutrition, lack of education, low life expectancy, and substandard housing are also, as a rule, more severe in rural areas. This is still true in Latin America, despite high urbanization rates (World Bank, 1990:29).

The World Bank estimates that an increase of one year in average years of education may lead to a 3% rise in GDP. In the LAC region, an increase in average years of education from five to six years is estimated to result in a percentage change in real GDP in excess of 2%. Looking across regions, the higher the initial level of education, the greater are the benefits from increasing it, a relationship that underscores the importance of investing in education. For the LAC region, estimated average social returns to investment in education are 26% for primary education, 18% for secondary education 18%, and 16% for higher education. As the World Bank (1990:80) notes:

> many of the poor are self-employed in agriculture.... But this does not weaken the case for investing in education. Educated farmers are more likely to adopt new technologies, and virtually all studies on agricultural productivity show that better-educated farmers get a higher return on their land.

Yet, for the LAC region, expenditures on primary education as a percentage of GDP, 1.06% in 1985, are expected to decline to 0.84% (at current enrollment rates) by the year 2000.

It is estimated that the incidence of poverty (the share of the population below the poverty line) in the LAC region will decline from 19.1% in 1985 to 11.4% by 2000. Yet nowhere in the developing world is the contrast between poverty and national wealth more striking than in the LAC region. While the region's average per capita incomes are five to six times those in South Asia and sub-Saharan Africa, the LAC region's very high degree of income inequality results in almost 20% of the population living in poverty.[1]

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[1]The World Bank estimates that raising all the poor in the continent to just above the poverty line would cost less than 1% (0.7%) of regional GDP, and that this amount is about equal to a 2% income tax on the wealthiest 20% of the population.

According to The World Bank, prospects for reducing poverty in the LAC region depend heavily on policy reforms in several areas. Of first importance, credible macroeconomic stabilization measures are essential for restoring the confidence of investors, encouraging flight capital return, and breaking the cycle of economic crises that has been characteristic of many countries in the region. Equally important are policies to promote growth and reduce inequality. A first requirement is removal of biases that favor the use of capital, in order to ensure incentive to invest in more labor-intensive enterprises and technologies, thereby helping to ensure that productive employment opportunities are generated for the poor. Price and financial policy reforms are needed to encourage private investment in efficient labor-intensive, outward-oriented industries.

Further, since 40 to 50% of the poor will still reside in rural areas in the 1990s, improvements in incentives for agricultural production will need to be complemented by active support for rural development. A second requirement is the need to maintain, and in some areas to expand, the provision of social services to the poor. Finally, during the stabilization process, transfers, such as the emergency employment schemes that have been used in Bolivia and Perú, may be needed.

The Bank's projected average GDP growth of 4.2% a year for the LAC region in the 1990s assumes that, during that decade's second half, debt burden will no longer be a serious constraint on regional investment and that, over the next few years, programs to restore economic stability will be put in place. Also, if income distribution improves with growth, as occurred, for example, in Colombia during the 1970s and 1980s, significant progress can be made in reducing regional poverty from 19% to 11% by 2000.

2. AID/Washington LAC Bureau Objectives

Given the state of poverty in the LAC region, the objectives of AID's LAC Bureau include, among other priorities, achievement of broad-based, sustainable economic growth which depends, in part, on increasing the contribution of LAC agriculture to the region's economic growth. As outlined in *LAC Program Objectives: Implementation Workplan* (AID, 1991), indicators of performance relative to this objective include:

- A limited role for the public sector as provider of goods and services;
- Sectoral policies that effectively address impediments to broadly based, sustainable growth in agriculture;
- Broader participation in income-generating activities;
- Growth in nontraditional [agricultural] exports;
- Priority given in public expenditures to investment in human capital development and related infrastructure; and
- Improved conservation and diminished contamination of soil, water, and air.

3. Role of Ag REE-Strengthening

The role of a country's Ag REE system is discussed in detail in section A.3 of Chapter VI. Generally, the role of the public and/or private components of a country's Ag REE system is to carry out technology generation and transfer (TG&T) essential for increasing agricultural productivity and agriculture's contribution to economic growth. The Ag REE system also has the role of developing the trained human resources needed in the agricultural sector, particularly the resources needed to develop more productive, sustainable technologies; to transfer these technologies to farmers; and to train the human resources required to carry out agricultural research, extension (or technology transfer), and education. The role of an Ag REE system with respect to institutional sustainability, human resource development, and development and dissemination of sustainable agricultural technologies is highlighted in Figure 1.1.

It is important to consider how effectively Ag REE systems in AID-assisted LAC countries have carried out agricultural TG&T in support of broad-based, sustainable economic growth, and whether LAC Ag REE systems are prepared to conduct TG&T that increases the contribution of agriculture to economic growth in these countries. However promising the decade of the 1990s may appear, the decade of the 1980s was a very difficult time for many or most LAC countries, particularly if measured in terms of agricultural sector performance.

During the 1980s, the LAC region placed increasing emphasis on agricultural exports. For the period, Gacitua and Bello (1991: 391-405) report a significant negative relationship between agricultural export promotion and food consumption. While the poverty of agricultural workers and small producers increased, food consumption decreased. "Succinctly, the open market policy implied that, while agricultural output increased, the production of staple food for domestic markets declined in some cases to levels far below the production levels of the 1960s, decreasing food consumption and food security" (Gacitua and Bello, 1991:394). At the same time, public sector programs in agricultural research and extension in most AID-assisted LAC countries did little to improve agricultural productivity, thereby further contributing to the decline in per capita food production (Figure 1.2) and an increase in cereal imports (Figure 1.3). Table 1.1 provides data on other agricultural sector trends in AID-assisted LAC countries.

One factor accounting for the failure to increase agricultural productivity in many LAC countries during the 1980s was a dramatic decline in public funding for agricultural research and extension (Table 1.2). Pardey and Roseboom (1990:2-4) report (1) that the real expenditure per researcher, between 1961-65 and 1981-85, fell by 7.9% in 129 less-developed countries and by 8.3% in 20 LAC countries, and (2) that:

Figure 1.1. Role of the Agricultural Research, Extension, and Education (REE) System Relative to LAC/DR/RD Goals and Objectives (Source: LAC/DR/RD).

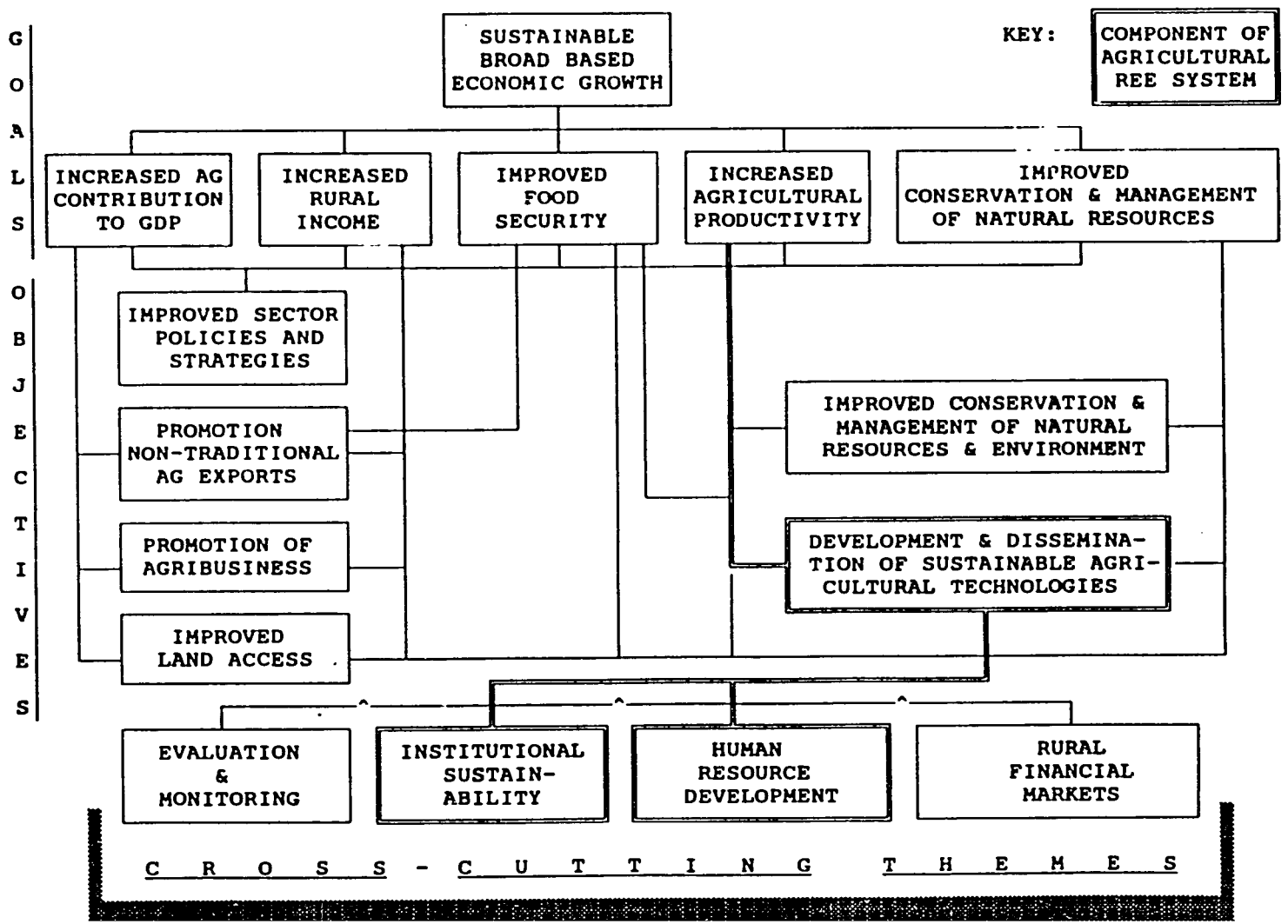


Figure 1.2. Per Capita Food Production in AID-Assisted LAC Countries (Source: IBRD World Development Report, 1989).

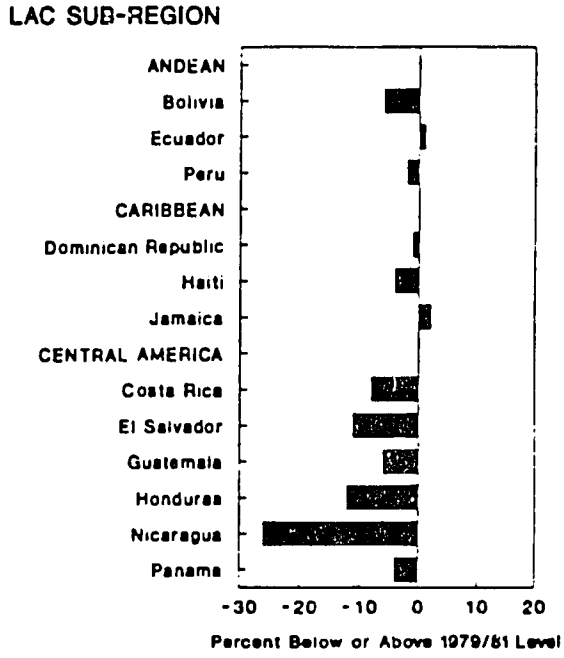
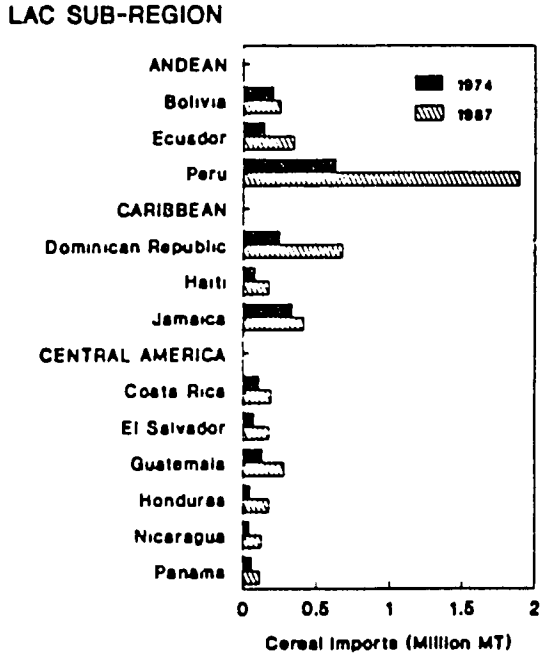


Figure 1.3. Growth in Cereal Imports to AID-Assisted LAC Countries (Source: IBRD World Development Report, 1989).



> A closer study of the period to period averages...reveals a general contraction in financial support for agricultural research in the less-developed countries during the latter period of the sample.... Anecdotal evidence suggests this contractionary pattern of support for public sector agricultural research has continued or even accelerated over the more recent past for many less-developed countries and may even have spread to some of the more-developed countries as well.... Average spending per scientist ratios for the Latin American and Caribbean region as a whole...show a widespread and substantial decline throughout the region in the early to mid 1980s. This decline was driven as much by stagnating expenditure levels as it was by a relatively rapid growth in research personnel which, given the current austerity measures facing many countries in the region, will pose continuing problems for these NARS [National Agricultural Research Systems].

Current estimates of the level of resources for research in national agricultural research systems (NARS) are provided in Table 1.3. Yet as a World Bank official noted at a recent meeting of the Inter-American Council: "If the rural population in [the LAC region] stays as it is, and the urban population increases as expected, production per farmer will have to increase enormously to provide enough food. Since there is no more land that can be used with the current level of technology, and no more water for agriculture, the only way to increase production is through technological advances" (personal communication from LAC TECH Agribusiness and trade advisor Ken Weiss).

4. Implications for LAC/DR/RD Programming

How did Ag REE systems in the LAC region reach the point of having such deteriorated capacity for agricultural TG&T? What, if anything, should AID do about the situation, and where, if anywhere, should AID look for solutions to the problem? It is interesting, in this context, that a recent memo of a development assistance agency raised the question of what is being or could be done to address urban problems in the LAC countries, and proposed a discussion of this question at an upcoming meeting. The memo noted that:

> Discussion is expected to encompass how our *location-neutral* [emphasis added] activities in such areas as health, credit, private sector, democratic initiatives, environment, education, etc., relate to urban problems, as well as whether there are urban problem interventions that might be appropriate that don't easily fit with these "traditional" sectors.

In regard to that memo, the following issued can be raised: *If "urban problems" are not addressed in the context of agriculture or vice versa, is there any hope of developing sustainable economic and social development in the LAC countries?*

It is important to bear in mind that food costs constitute a large percentage of the LAC urban consumer budget, even though LAC urban food prices often are highly subsidized. While the urban consumer is a primary beneficiary of food subsidies are a drain on the public sector budget and in the long run will become economically and politically

Table 1.1. Performance of Agricultural Sector in AID-Assisted LAC Countries.

COUNTRIES a)	Average Annual GNP Growth Rate 1965-88	Average Annual Growth Rate (%) GDP 65-80	GDP 80-88	Agriculture 65-80	Agriculture 80-88	Agriculture as % of GDP 65	88
ANDEAN							
Bolivia	-0.6	4.5	-1.6	3.8	2.1	23	24
Ecuador	3.1	8.7	2.0	3.4	4.3	27	15
Perú	0.1	3.9	1.1	1.0	3.6	18	12
CARIBBEAN							
Dominican Rep.	2.7	7.9	2.2	6.3	0.8	23	23
Haiti	0.4	2.9	-0.2	-	-	-	31
Jamaica	-1.5	1.3	0.6	0.5	0.9	10	6
CENTRAL AMERICA							
Costa Rica	1.4	6.2	2.4	4.2	2.5	24	18
El Salvador	-0.5	4.3	0.0	3.6	-1.4	29	14
Guatemala	1.0	5.9	-0.2	-	-	-	-
Honduras	0.6	5.0	1.7	2.0	1.1	40	25
Nicaragua	-2.5	2.6	-0.3	3.3	-0.2	25	21
Panamá	2.2	5.5	2.6	2.4	2.5	18	9

COUNTRIES a)	Average Annual Population Growth 65-88	80-88	88-2000	Education as % of Total Central Govt Expenditure 72	88	Public & Publicly Guaranteed Long-Term Debt (Millions US$) 72	88
ANDEAN							
Bolivia	2.5	2.7	2.7	31.3	18.4	480	4451
Ecuador	3.1	2.7	2.2	27.5	-	193	9353
Perú	2.8	2.2	2.1	20.0	23.6	856	12475
CARIBBEAN							
Dominican Rep.	2.7	2.4	1.8	14.2	-	212	3216
Haiti	2.0	1.8	1.9	-	-	40	683
Jamaica	1.3	1.5	0.5	-	-	160	3512
CENTRAL AMERICA							
Costa Rica	2.7	2.3	2.0	28.3	16.2	134	3531
El Salvador	2.7	1.3	2.1	21.4	17.1	88	1630
Guatemala	2.8	2.9	2.8	-	-	106	2131
Honduras	3.2	3.6	2.9	22.3	-	90	2739
Nicaragua	3.1	3.4	3.0	16.6	-	147	6744
Panamá	2.6	2.2	1.6	20.7	15.6	194	3625

Table 1.1. Continued.

COUNTRIES a)	Food as % of Merchandise Imports		Food Aid in Cereal (Metric Tons) ('000)		Cereal Imports (Metric Tons) ('000)		Fertilizer Consumption (Hundreds of Grams of Plant Nutrient Per Hectare of Arable Land)		Avg. Index of Food Production Per Capita (79-81=100)	Food as % Share of Total Household Consumption
	65	88	74/75	87/88	74	88	70/71	87/88	86-88	80 or 85
ANDEAN										
Bolivia	19	15	22	290	209	328	7	19	95	33
Ecuador	10	5	13	33	152	563	133	232	97	30
Perú	17	19	37	355	637	1857	300	622	96	35
CARIBBEAN										
Dominican Rep.	23	16	16	278	252	601	334	556	95	46
Haiti	25	14	25	154	83	205	4	25	95	-
Jamaica	20	14	1	208	340	418	873	914	101	39
CENTRAL AMERICA										
Costa Rica	9	5	1	235	110	318	1001	1806	89	33
El Salvador	15	15	4	177	75	217	1043	1262	87	33
Guatemala	11	6	9	320	138	166	298	656	92	36
Honduras	11	8	31	146	52	144	156	190	76	39
Nicaragua	12	25	3	87	44	206	215	433	71	-
Panamá	11	9	3	-	63	93	387	657	95	38

a) Comparable data not reported for Belize and RDO/C (Eastern Caribbean States)

Source: World Bank (1990), Poverty: World Development Report 1990.

Table 1.2. Agricultural Research Indicators in the LAC Region (adapted from ISNAR, 1989).

REGION/COUNTRY	Ph.D.	M.Sc.	B.Sc.	Sub-total	Ex-pats	Total	Research Expenditures: %Change Researchers Since 1980	Research Expenditures: % Change Since 1980 in Constant LCUs	In Constant 1980 US$ PPP	Principal Research Organization
ANDEAN REGION										
Bolivia (83) a)	2	31	54	87	17	104	-8.8	-50.6 (83)	2.224 (83)	IBTA
Ecuador (86)	5	67	153	225	*	225	+12.5	-39.2 (86)	10.973 (86)	INIAP
Perú (80)	4	30	239	273	*	273 (85)	0.0	+200.2 (84)	24.759 (84)	INIAA
CARIBBEAN										
Dominican Rep. (83)	2	29	105	136	0	136	+28.3	+37.2 (83)	4.766 (83)	DIA/SEA
Haiti (83)	7	23	2	32	*	32	*	+112.8 (83/78) b)	1.623 (83)	CDRA
Jamaica (80)	4	23	22	49	*	49	*	* -49.3 (81/71)	2.399 (81)	MOA & CARDI
OECS:										CARDI (all):
Antigua (84)	1	3	1	5	*	5	+66.7	*	*	
Dominica (83)	0	2	4	6	*	6	*	-51.1 (84/82)	.103 (83)	MOA
Montserrat (84)	0	1	1	2	*	2	*	*	*	
St. Kitts-Nevis (84)	1	3	2	6	*	6	+100.0	+8.3 (83)	.061 (81)	
St. Lucia (87)	6	5	10	21	0	21	*	*	1.791 (83)	MOA, WINBAN
St. Vincent (86)	0	2	2	4	1	5	-20.0	*	*	
CENTRAL AMERICA										
Belize (82)	*	*	*	*	*	16	*	*	*	DOA/RD
Costa Rica (84)	*	*	*	*	*	114 (81)	*	-54.0 (84)	1.984 (84)	DIA
El Salvador (80)	*	*	*	*	*	106	*	* (80)	4.454 (80)	CENTA
Guatemala (85)	2	25	101	128	4	132	+10.0	-11.1 (84)	6.801 (84)	ICTA
Honduras (82)	*	*	*	*	*	65	-8.4	* (80)	1.554 (80)	PNIA
Nicaragua (80)	*	10	47	*	*	57	*	* (80)	3.610 (80)	MAG/INTA
Panamá (86)	9	41	90	140	*	140	+118	+11.3 (85)	5.729 (85)	IDIAP

* = Data not available or inadequate to calculate indicator.
a) Year in parentheses is most recent year for which data are available or was year used in calculating the indicator.
b) Most recent year relative to present year.

Table 1.3. National Agricultural Research Resources in the LAC Region-Expressed as 1980-1985 Averages.

LAC SUB-REGIONS	Personnel a)	Agricultural Research Expenditures b)	Agricultural Research Expenditures per Capita c)	ARI d)	Qualification Index e)
ANDEAN REGION					
Bolivia	107	3.36	30	0.22	0.3
Ecuador	209	14.06	69	0.54	0.3
Perú	265	18.66	52	0.56	0.12
Sub-Total	581	36.08			
Average			50.3		
CARIBBEAN					
Dom. Rep.	121	3.8	34	0.19	0.18
Haiti	32	1.62	51	0.13	0.94
Jamaica	49	2.4	-	0.77	0.55
RDO/C	45	2.02	45 f)	0.8 g)	0.47
Sub-Total	247	9.84			
Average			43.3		
CENTRAL AMERICA					
Belize	15	-	-	-	-
Costa Rica	114	3.29	29	0.24	-
El Salvador	106	4.45	42	0.24	-
Guatemala	150	7.4	49	0.22	0.17
Honduras	68	1.55	29	0.17	0.25
Sub-Total	453	16.69			
Average			37.3	0.22	0.21
TOTAL	1281	62.61			

a) Personnel & Agricultural Research Expenditures: Pardey and Roseboom (1988)
b) Ag'l Gross Domestic Product (AgGDP): UN (1988).
Ag'l Research Expenditures: Expressed in millions of 1980 US$. Expenditures were first deflated to constant 1980 currency units using an implicit GDP deflator (UN, 1988). They were then converted into 1980 US$ using PPP over GDP indices from Summers and Heston (1988).
c) Ag'l Research Expenditures per Scientist:Ag'l Research Expenditures/Personnel ('000 of 1980 US$).
d) ARI (Ag'l Research Intensity Ratio):Ag'l Research Expenditures/AgGDP (in percent).
e) Qualification Index: PhD + MS/total scientists (inclusive of expatriate personnel, who are assumed to hold a higher degree).
f) Average of Dominica, St. Kitts-Nevis, and St. Lucia.
g) Figure is for St. Kitts-Nevis only.

Source: Valverde (1990:28-29)

unsustainable: They will compromise the ability of the market to perform efficiently and reduce the incentive for farmers to produce.

At the same time, there is upward pressure on urban food prices to the extent that the internal marketing system is inefficient, with marketing losses and higher per-unit costs resulting in higher food prices to urban consumers, without any of the benefit of higher prices being captured by the producer. Marketing losses and inefficiency not only penalize the urban consumer but also the farmer, as marketing intermediaries must compensate for anticipated losses by lowering commodity prices to producers.

The net result of this situation is reduced demand for farm produce, lowered incentive for farmers to produce or raise productivity, and little to no demand for productivity-increasing agricultural technology or support of research aimed at raising agricultural productivity. Thus, the problems of urban food prices, productivity stagnation in rural farming areas, and environmental degradation are highly interrelated, greatly influenced not only by economic and agricultural policies but also by the efficiency of marketing, production, research, extension, and educational and training institutions.

Agriculture is as much "location-neutral" as are health, credit, private sector, democratic initiatives, environment, education, etc. The sector's performance and contribution to economic growth are greatly influenced by a country's urban standard of living. A higher standard of living—greater income and purchasing power—translates into increased demand for food and a signal for the agricultural sector to boost productivity and production to meet the demand for food in urban markets.

USAID strategies, programs, and projects in the LAC region have placed little to no emphasis on a systematic analysis of and attack on the interrelationship between urban and rural poverty. AID's emphasis in recent years increasingly has been outward-looking (nontraditional agricultural export crops) and not inward-looking (traditional food crops). Agriculture is being abandoned at the same time that development assistance agencies are asking what to do about urban problems and urban development. LAC urban development problems cannot be solved by searching for "urban problem interventions that might be appropriate that don't easily fit with [the aforementioned] 'traditional' sectors [health, credit, ...]," as if there were some "magic bullet," or a sector that somehow has remained hidden. The agricultural sector is not hidden but is being neglected in a manner counterproductive to broad-based economic growth. Moreover, continued neglect of and lack of development in LAC rural areas will only lead to a continuing and growing influx of the rural populace to LAC urban areas, further aggravating the urban problem and the difficulty of urban development.

With regard to LAC Bureau objectives, more attention needs to be placed on the LAC urban problem, but in the context of its interrelationship with agricultural productivity in countries where agricultural institutions are not yet adequately developed. Clearly, there is a need for increased attention to the problems of food security and the constraints to increased agricultural productivity (lack of demand for productivity-increasing technologies). This is

where AID should begin to look for a solution to the problem of LAC Ag REE systems having such a deteriorated capacity for agricultural TG&T.

Donors such as AID are now beginning to face up to the serious problems of the 1990s: employment, food production, and protection of the environment. With a growing population, the LAC countries must create more employment. But employment expansion will depend on rapid agricultural growth, and agricultural productivity must increase in such a manner that the environment is not damaged. This will require not only improved technology that does not exist today, but also strengthened and sustainable agricultural technology generation and transfer (TG&T) capacity. Addressing these problems will require a strong increase in development assistance for agricultural projects and programs.

CHAPTER II
FUNDING TRENDS FOR AGRICULTURAL RESEARCH, EXTENSION, AND EDUCATION (AG REE) IN THE LAC REGION

This chapter reviews general trends in USAID Latin America and the Caribbean (LAC) agriculture, rural development, and nutrition (ARDN) funding for Ag REE in the LAC region and other donor funding and activity for LAC Ag REE-strengthening.

A. General Trends in LAC ARDN Funding for Ag REE

In 1988, AID/W conducted a review of over 1,000 projects active in AID's ARDN portfolio in FY84-FY89 or proposed for FY90, in order to examine how the projects related to the ARDN Focus Statement: "The focus of the Agency's [ARDN] program is to increase the income of the poor majority and expand the availability and consumption of food, while maintaining and enhancing the natural resource base" (Chemonics International Consulting Division, 1988). LAC Bureau projects accounted for about 15 percent of the ARDN portfolio. The study related funding obligations for each project to the ARDN Focus Statement's food, income, and natural resources goals and to the specific purpose categories to which the project was directed.[1] ARDN funding to support agricultural research, extension, or education was comprised of four purpose categories, as reported in Table 2.1 (LAC region) and Table 2.2 (all regions).

For FY84-FY89, 67% of obligations in LAC's portfolio were directed at the ARDN Focus Statement goal of income enhancement, while 20.6% were directed to food, 8.0% to natural resources, and 4.4% to all three goals [Chemonics International Consulting Division, 1988:F-3, Table III-B (1)]. There was a significant recent trend in obligation increases for natural resources (to 25% of the portfolio) and corresponding declines in obligations for food and income (to 15% and 50%, respectively). Figure 2.1 shows that obligations for the natural resource goal increased as obligations for food and income declined. As Figure 2.2 shows, obligations for technology transfer increased but declined in FY89. While obligations for technology development increased from FY86 to FY88, they declined between FY88 and FY89. Growth in obligations for technology transfer, marketing, and resource development were fueled by declining obligations for credit. LAC funding by Economic Support Funds (ESF) is not programmed to support agriculture, except as country-owned local currencies generated from ESF. LAC does not "projectize" ESF. ESF and PL 480 local currency generations are host country-owned and not accounted for by AID (i.e., not included in the ARDN data base). Thus, available data may underestimate the true investment in ARDN activities.

[1]Purpose categories were: planning and policy analysis (PPA), technology development (TDE), technology transfer (TTR), marketing (MKT), input delivery capacity strengthening (INP), credit development (CRE), construction (CON), resource development (RED), land tenure (LTE), human resource development (HRD), education system development (ESD), and sector support (SEC).

Table 2.1. Percent Distribution of AID Obligations in the LAC Region for ARDN Purpose Categories Relating Directly to Agricultural Research, Extension, and Education.

%	Purpose Category
7	Technology development (TED): to conduct* or improve* the capacity for conducting research on improved technologies for production and consumption.
10	Technology transfer (TTR): to extend* or improve* the capacity for extension/diffusion/transfer of improved technologies for production and consumption.
0	Education system development (ESD): to develop* or strengthen* the capacity to develop education institution structure/curricula/operations/facilities.
5	Human resource development (HRD): to improve* or strengthen* the capacity to improve training and human resource development.
22	Total

*or expand, establish, strengthen, study, organize, etc., as appropriate.

Source: Chemonics International Consulting Division, 1988:F-3.

The study noted that investment in technology transfer has tended to expand in each geographic region, while investment in technology generation has remained static or even declined. This trend was identified as "worrisome, since productive technology transfer depends upon a continuous stream of innovative technology." The study speculated that this "inversion" may reflect increasing attention to:

> on-farm research and corresponding attention to research on farmer motives for adoption or rejection of productive technology. The neglect of this topic in traditional research programs has made much commodity-oriented research unproductive. On the other hand, the decline in technology generation may reflect overdependence on the output of...international agricultural research...without development of an indigenous capacity to adapt that output to specific national conditions (Chemonics International Consulting Division, 1988:33).[2]

Including all three geographical bureaus (Africa, Asia and the Near East, and LAC), the study concluded that the Agency's goal for the 1990s and the ARDN focus statement goals are appropriate and consistent and should not be changed significantly in the foreseeable future. But the Joint Sector Councils recommended that development and

[2]During the study period, increasing emphasis was placed in the LAC region on development of nontraditional agricultural exports (NTAE) crops. But there are no international agricultural research centers (IARCs) working on such crops; and public sector agricultural research systems in AID-assisted LAC countries traditionally have little or no experience with NTAE crops. Thus, farmers seeking to grow and export such crops have tended to rely on private sources for the expertise required to adapt crop-specific technologies to site- specific growing conditions (Byrnes, 1989).

Table 2.2. Percent Distribution of AID Obligations in ARDN Portfolio by Purpose Category (FY84-FY89).

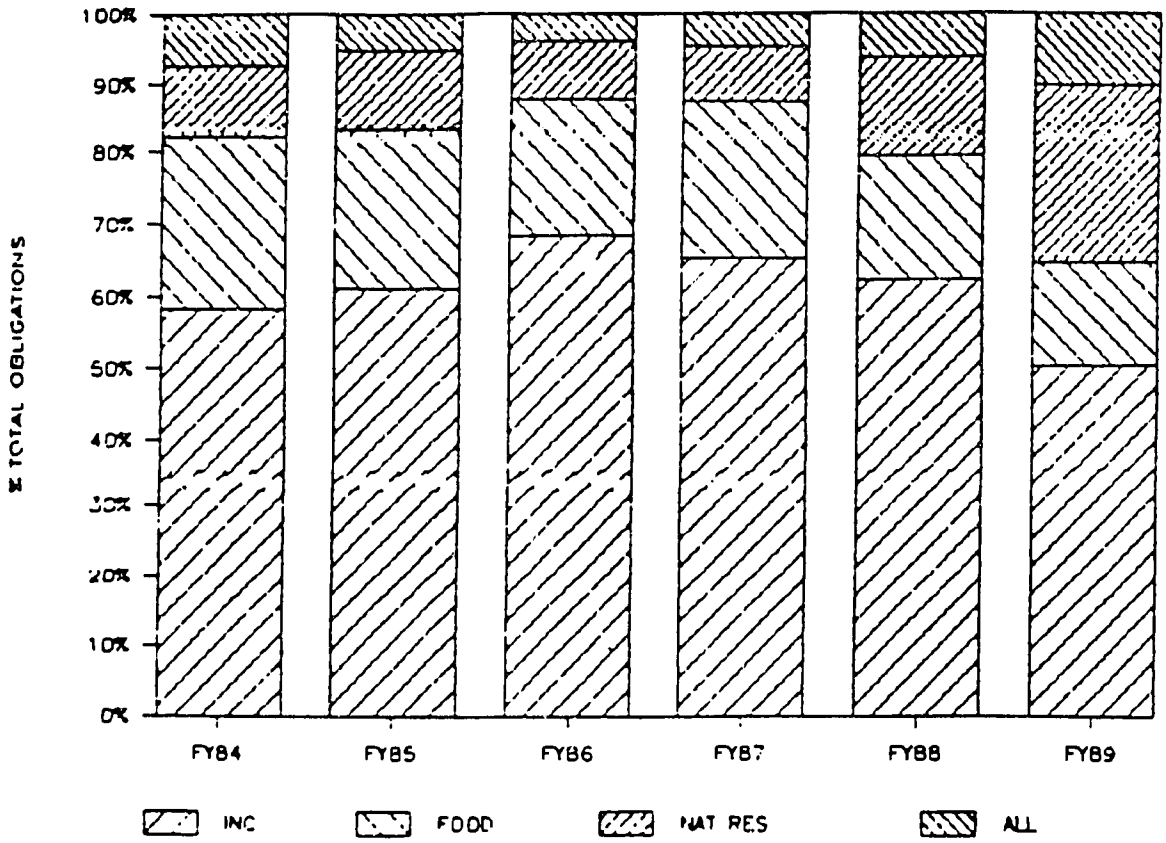
PURPOSE CATEGORY	TOTAL AID	AFR	ANE	LAC	CENTRAL
Research/Extension/Education					
Technology Development	11.5	14	6	7	64
Technology Transfer	15.5	15	18	10	2
Educational System Development	2.5	4	3	0	0
Human Resource Development	3.5	5	3	5	1
(Sub-Total)	(33.0)	(38)	(30)	(22)	(67)
Other Sectors					
Construction	17.5	10	24	10	0
Credit	17.0	2	20	33	14
Input	2.0	5	3	0	0
Land Tenure	1.5	0	0	9	1
Marketing	2.5	2	0	11	0
Planning & Policy Analysis	6.0	7	6	5	5
Resource Development	4.5	3	4	4	13
Sector Support	16.0	35	12	4	0
TOTAL	100	100	100	100	100

Source: Chemonics International Consulting Division, 1988:F-3.

implementation of "a strategy for AID support for sustained rural economic growth in the 1990s" would provide opportunity to better focus the ARDN portfolio. The following needed changes in the portfolio were identified:

- The need to concentrate on sustainable agriculture as well as protection of the natural resource base, concentrating particularly on the generation and transfer of appropriate technology and the development of a macroeconomic and policy environment that provides incentives for the adoption of such technology.

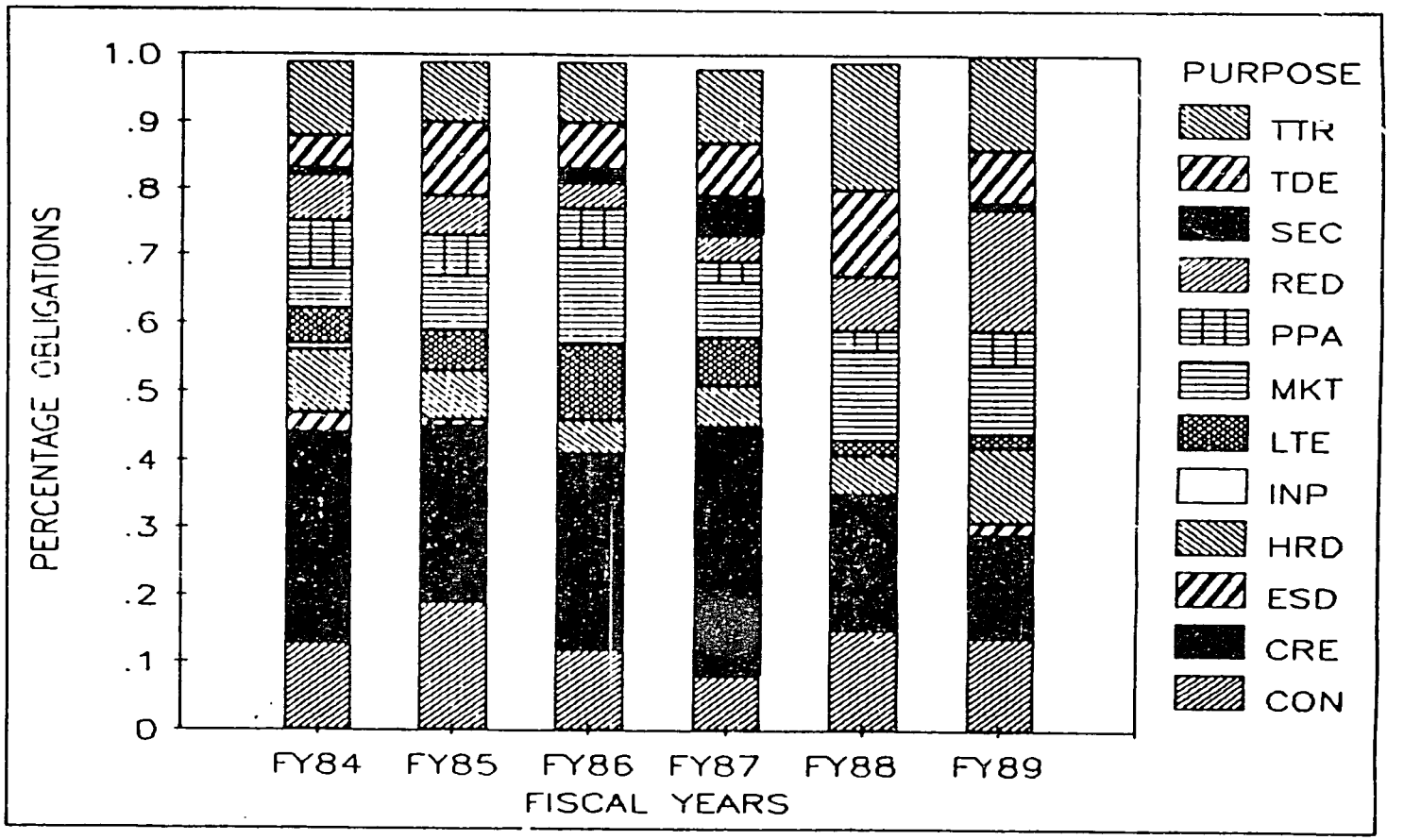
Figure 2.1. Total ARDN Obligations (FY84-FY89) Toward ARDN Focus Statement Goals for the LAC Region (Chemonics International Consulting Division, 1988:12).



Key:

INC	= Income
FOOD	= Food
NAT RES	= Natural Resources
ALL	= All

Figure 2.2. LAC ARDN Obligations (FY84-FY89) by Purpose Category (Chemonics International Consulting Division, 1988:16). (See footnote for key to purpose categories).[3]



[3]Purpose categories are: planning and policy analysis (PPA), technology development (TDE), technology transfer (TTR), marketing (MKT), input delivery capacity strengthening (INP), credit development (CRE), construction (CON), resource development (RED), land tenure (LTE), human resource development (HRD), education system development (ESD), and sector support (SEC).

- The need to continue expansion of relative investment directed at improving the macroeconomic and agricultural policy environment, particularly host-country planning and policy analysis capacity.

- The need to reduce allocations to credit and construction, with the savings reallocated to other areas that would have a potentially larger impact (such as natural resources and sustainable agriculture, and improving the macroeconomic and agricultural policy environment).

Further analysis of the ARDN portfolio was carried out by LAC/DR/RD in 1989. This analysis reviewed the portfolio in terms of "strategic funding categories" for FY88-FY91. The analysis provides an indication of current and projected trends in ARDN funding for agricultural research, extension, and education in the LAC region. For this analysis, agricultural research, extension, and education were defined as follows:

Agricultural Research: activities carried out at LDC institutions, in the U.S., or at international agricultural research centers (IARCs) that support agronomic research, including on-station, basic, on-farm, applied, and farming systems research; includes the development of improved agricultural practices and extension efforts when undertaken as part of agricultural research.

Agricultural Extension: activities to transmit knowledge of new agricultural methods, plant varieties, and products directly to farmers; includes strengthening of government or private extension and outreach services, improving dissemination techniques, and providing improved communication and transportation.

Agricultural Education: all activities support[ing] agricultural education; includes all activities supporting faculties of agriculture at the undergraduate and graduate levels.

Tables 2.3 through 2.6 summarize the LAC ARDN portfolio by strategic funding categories for the FY88-FY91 period; the percentages in Tables 2.4 and 2.6 are derived from Tables 2.3 and 2.5, respectively. These tables were originally prepared in late 1989. At the time, the data in the FY88 column were final actual obligations, while the data in the FY89 column were actual obligations, with a possibility that the final obligations could be at variance with the FY89 operational year budget (FY89 OYB). The data in the FY90 column were based on the FY90 operational year budget, while the data in the FY91 column derive from the Annual Budget Submission (ABS) in the FY 91 Congressional Presentation (CP). The FY89 final actual obligations data were incorporated into the table in November 1990, thus making the FY88 and FY89 data final actual obligations. Updated FY91 ABS data from the approved FY91 OYB as well as the new FY92 ABS data were anticipated to become available in late January 1991. Incorporation of these data into the tables would provide coverage of a five-year time span.

Table 2.3. LAC Bureau ARDN Portfolio Summary by Strategic Funding Categories (FY88-FY91): $'000.

STRATEGIC CATEGORY		TOTAL LAC BUREAU			
		FY88	FY89	FY90	FY91
AGRICULTURE (total)		92627	131919	136761	133021
Agricultural Research	=	16130	12076	15416	10994
Agricultural Extension	=	15601	19897	16982	14181
Agricultural Education	=	4257	14456	3109	2336
Ag/Nutrition Mgmt., Planning & Policy	=		2624		
Agricultural Land Use and Settlement	=	1653	2062	3748	3765
Agricultural Policy	=	2073	29526	50784	71548
Agricultural Inputs	=	595	3942	1417	208
Agricultural Irrigation	=	4883	4729	3957	3837
Pest Management	=	918	1834	1518	1135
Agricultural Credit	=	17431	15194	10733	8976
Agricultural Marketing	=	2906	3828	2492	2411
Agribusiness	=	12435	15335	18088	3832
Infrastructure (Rural Roads)	=	13745	6416	8067	9798
NATURAL RESOURCES/ENVIRONMENT (total)		18484	28823	32044	29825
Forestry	=	6957	10376	11515	10676
Environmental Mgmt., Planning/Policy	=	4162	12557	12575	7886
Soils	=	165	1388	2241	1640
Agricultural Land Development	=	939	1275	1939	1623
Water Resources Management	=	781	2718	3331	7450
Energy (Fuelwood)	=	5480	509	443	550
NARCOTIC AWARENESS	=	0	0	0	125000
GRAND TOTALS	=	111111	160742	168805	287846

Table 2.4. LAC Bureau ARDN Portfolio Summary by Strategic Funding Categories (FY88-FY91): Percentages.

STRATEGIC CATEGORY		TOTAL LAC BUREAU			
		FY88	FY89	FY90	FY91
AGRICULTURE (total)		83.3	82.1	81.0	81.7 a)
Agricultural Research	=	17.4	9.2	11.3	8.3
Agricultural Extension	=	16.8	15.1	12.4	10.7
Agricultural Education	=	4.6	11.0	2.3	1.8
Ag/Nutrition Mgmt., Planning & Policy	=		2.0		
Agricultural Land Use & Settlement	=	1.8	1.6	2.7	2.8
Agricultural Policy	=	2.2	22.4	37.1	53.8
Agricultural Inputs	=	0.6	3.0	1.0	0.1
Agricultural Irrigation	=	5.3	3.6	2.9	2.9
Pest Management	=	1.0	1.4	1.1	0.9
Agricultural Credit	=	18.8	11.5	7.8	6.7
Agricultural Marketing	=	3.1	2.9	1.8	1.8
Agribusiness	=	13.4	11.6	13.2	2.9
Infrastructure (Rural Roads)	=	14.8	4.9	5.9	7.4
NATURAL RESOURCES/ENVIRONMENT (total)		16.7	17.9	19.0	18.3 b)
Forestry	=	37.6	36.0	35.9	35.8
Environmental Mgmt., Planning/Policy	=	22.5	43.6	39.2	26.4
Soils	=	0.9	4.8	7.0	5.5
Agricultural Land Development	=	5.1	4.4	6.1	5.4
Water Resources Management	=	4.2	9.4	10.4	25.0
Energy (Fuelwood)	=	29.6	1.8	1.4	1.8
NARCOTIC AWARENESS	=	0	0	0	43.4 c)
		100	100	100	100

FY Funding as % of Total ARDN Funding, including total Natural Resources and Environment:

STRATEGIC CATEGORY		TOTAL LAC BUREAU				
		FY88	FY89	FY90	FY91	FY91 d)
Agricultural Research	=	14.5	7.6	9.4	3.7	6.4
Agricult[illegible]ral Extension	=	14.0	12.4	10.4	4.8	8.2
Agricult[illegible]al Education	=	3.8	9.0	1.9	0.8	1.3

a) Perce[illegible] if funding of $125,000 for Narcotic Awareness not included; if fu[illegible] for Narcotic Awareness is included, percentage is 46.2%.
b) Percent[illegible] funding of $125,000 for Narcotic Awareness not included; if fundi[illegible] Narcotic Awareness is included, percentage is 10.4%.
c) Funding o[illegible]00 for Narcotic Awareness as a percentage of total ARDN funding of $[illegible]6 (see Table 2.3)
d) FY91 (if not i[illegible]de Narcotics Awaren[illegible])

1. Funding Trends Over Time

As a percentage of total funding for Agriculture, funding for agricultural research, extension, and education (Ag REE) fell significantly during the subject period. The decline in funding support for these areas is even more dramatic when the absolute funding is taken as a percentage of total funding for Agriculture and Natural Resources/ Environment. LAC funding for Ag REE, as a percent of total funding for Agriculture, and as a percent of total funding for Agriculture *and* Natural Resources/Environment (the percentages enclosed in parentheses), fell in each of three functions—research, extension, and education—as follows:

	Research		Extension		Education	
FY88	17.4%	(14.5%)	16.8%	(14.0%)	4.6%	(3.8%)
FY89	9.2%	(7.6%)	15.1%	(12.4%)	11.0%	(9.0%)
FY90	11.3%	(9.1%)	12.4%	(10.1%)	2.3%	(1.8%)
FY91	8.3%	(3.7%)	10.7%	(4.8%)	1.8%	(.8%)

Between FY88 and FY91, funding for agricultural research was cut by more than half (52%) from 17.4% in FY88 to 8.3% in FY91, funding for extension was cut by more than a third (36%) from 16.8% to 10.7%, and funding for education was cut by over 60% (61%) from 4.6% to 1.8%. If FY91's allocation of $125,000,000 (43.4% of FY91 ARDN funds of $297,846,000) for narcotics awareness is included, the percentages fall even lower, from 14.5% to 3.7% for agricultural research, from 14.0% to 4.8% for extension, and from 3.8% to 0.8% for education.

These trends indicate that the reductions in funding support have been biggest precisely in the area (education) with greatest potential for developing the human capital on which the success of future agricultural TG&T efforts will depend. On the other hand, funding reductions have been smallest precisely in the area (extension) with the least long-term potential for increasing the farmer's returns to adoption of improved technology. Without the generation of new productivity-increasing and/or cost-reducing technologies, investing in extension for transfer of the existing technologies to farmers inevitably leads to a reduction in the marginal returns to farmer adoption of those technologies. By comparison, investment in education and research (technology generation) provide the basis for increasing potential returns to farmers from the adoption of new technologies, because education and research are the basis for developing technologies that are more productive and less costly or risky relative to existing technologies.

Looking at agricultural research, extension, and education relative to the remainder of the LAC ARDN portfolio, if FY91 funding for Narcotic Awareness is not taken into account, funding for agriculture relative to natural resources/environment fell slightly from 83.3% in FY88 to 81.7% in FY91, while funding for natural resources/ environment increased from 16.7% in FY88 to 18.3% in FY91. Water resources management accounted for the largest relative increase in the natural resources/ environment component of the portfolio, an increase from 4.2% in FY88 to 25% in FY81. The largest relative increment

in funding support in the ARDN portfolio occurred in the agricultural policy area, where funding increased from 2.2% of the ARDN portfolio's agriculture component in FY88 to 53.8% in FY91. But if the $125,000,000 of funding for Narcotic Awareness, or 43.4% of total ARDN funding for the Andean Region in FY91, is taken into account, all of the FY91 percentages fall dramatically—agriculture to 46.2% of the ARDN portfolio (down from 81.7% in FY90) and natural resources/environment to 10.4% of the portfolio (down from 43.4% in FY90).

2. Funding Trends by Subregion

Tables 2.5 through 2.8 summarize funding trends for agricultural research, extension, and education by LAC subregion: Central America (CA), the Caribbean (CN), and the Andean Region (AN). The percentages in Table 2.6 are based on the dollar figures in Table 2.5, while Tables 2.7 and 2.8 are taken directly from Table 2.6.

As the reader may see in Table 2.7, funding for agricultural research as a percentage of total LAC ARDN funding fell by nearly 97% in Central America (15.6% in FY88, 0.5% in FY91) and by over 84% in the Andean Region (16.3% in FY88, 2.7% in FY91), while funding for agricultural research in the Caribbean nearly tripled (8.3% in FY88, 24.7% in FY91).

In agricultural extension, funding as a percentage of total LAC ARDN funding fell by nearly 77% in Central America (10.3% in FY88, 2.4% in FY91) and by nearly 75% in the Andean Region (15.9% in FY88, 4% in FY91), while funding for agricultural extension in the Caribbean increased by nearly 25% (17.4% in FY88, 21.3% in FY91). Thus, the funding trends in agricultural extension in each subregion were parallel to those in agricultural research.

In agricultural education, funding as a percentage of total LAC ARDN funding fell by over 85% in Central America (5.5% in FY88, .8% in FY91) and by nearly 93% in the Andean Region (4% in FY88, .3% in FY91), while funding for agricultural education in the Caribbean increased from 0% to an average of 5% for the period (but 3.9% in FY91). The funding trends in agricultural education in each subregion were parallel to those in agricultural research and extension.

Table 2.5. LAC Bureau ARDN Portfolio Summary by Strategic Funding Categories (FY88-FY91): $'000 by Subregion.

STRATEGIC CATEGORY		ANDEAN				CARIBBEAN				CENTRAL AMERICA			
		FY88	FY89	FY90	FY91	FY88	FY89	FY90	FY91	FY88	FY89	FY90	FY91
AGRICULTURE (total)		40062	16871	43426	22563	15563	23599	19004	18916	37002	90555	74331	91542
Ag'l Research	=	7737	4830	5668	4033	1779	3261	6326	6436	6614	3971	3422	525
Ag'l Extension	=	7505	5245	7824	5973	3733	6243	4890	5571	4363	8395	4268	2637
Ag'l Education	=	1910	1096	622	419	0	1800	1671	1025	2347	11226	816	892
Ag'l/Nutrition Mgmt., Planning & Policy	=		1629				572				279		
Ag'l Land Use & Settlement	=	515	130	525	935	815	1175	1113	600	323	557	2110	2330
Ag'l Policy	=	1022	598	1611	1957	86	392	1180	1311	965	28490	47993	68280
Ag'l Inputs	=	50	130	250	160	81	2238	30	15	464	1574	1137	33
Ag'l Irrigation	=	0	0	0	0	3165	971	184	127	1718	3758	3773	3710
Pest Management	=	43	0	84	72	0	0	377	400	875	1779	1057	663
Ag'l Credit	=	10623	1209	5134	1537	3938	2226	603	607	2870	11759	4996	6832
Ag'l Marketing	=	174	184	320	628	84	884	1079	1168	2648	2760	1543	615
Agribusiness	=	8252	1356	16515	1271	1282	958	1151	1056	2901	12934	422	1505
Infrastructure (Rural Roads)	=	2231	464	4873	5578	600	2879	400	600	10914	3073	2794	3620
NATURAL RESOURCES/ ENVIRONMENT (total)		7281	1277	2801	2340	5845	7641	8302	7182	5358	18304	20941	20303
Forestry	=	856	1023	1421	1144	1950	2565	3366	3801	4151	6500	6728	5731
Environmental Mgmt., Planning/Policy	=	1370	150	1122	1016	2109	3243	2529	1201	683	8017	8924	5669
Soils	=	55	104	258	180	110	44	283	360	0	1240	1700	1100
Ag'l Land Development	=	0	0	0	0	815	1235	1881	1520	124	40	58	103
Water Resources Mgmt.	=	0	0	0	0	381	45	0	0	400	2507	3331	7450
Energy (Fuelwood)	=	5000	0	0	0	480	509	243	300	0	0	200	250
NARCOTIC AWARENESS	=	0	0	0	125000	0	0	0	0	0	0	0	0
		=====	=====	======	=======	=====	=====	=====	====	=====	======	=====	=====
GRAND TOTALS	=	47343	18148	46227	149903	21408	31240	27306	26098	42360	108859	95272	111845

Table 2.6. LAC Bureau ARDN Portfolio Summary by Strategic Funding Categories (FY88-FY91): Percentages by Subregion (* = less than one-tenth of one percent).

STRATEGIC CATEGORY		ANDEAN				CARIBBEAN				CENTRAL AMERICA			
		FY88	FY89	FY90	FY91	FY88	FY89	FY90	FY91	FY88	FY89	FY90	FY91
AGRICULTURE (total)		84.6	93.0	93.9	14.9	72.7	75.5	69.6	72.4	87.4	83.2	78.0	81.7
Ag'l Research	=	16.3	26.6	12.3	2.7 a)	8.3	10.4	23.2	24.7	15.6	3.6	3.6	0.5
Ag'l Extension	=	15.9	28.9	16.[illegible]	4.0 a)	17.4	20.0	17.9	21.3	10.3	7.7	4.5	2.4
Ag'l Education	=	1.0	6.0	1.4	0.3 a)	0	5.8	6.1	3.9	5.5	10.3	0.9	0.8
Ag'l/Nutrition Mgmt., Planning & Policy	=		9.0				1.8				0.3		
Ag'l Land Use & Settlement	=	1.1	0.7	1.1	0.6	3.8	3.8	4.1	2.3	0.8	0.6	2.2	2.0
Ag'l Policy	=	2.2	3.3	3.5	1.3	0.4	1.2	4.3	5.0	2.3	26.2	50.4	61.0
Ag'l Inputs	=	0.1	0.7	0.5	0.1	0.4	7.2	0.1	0.1	1.1	1.4	1.2	*
Ag'l Irrigation	=	0	0	0	0	14.8	3.1	0.7	0.5	4.1	3.4	4.0	3.3
Pest Management	=	0.1	0	0.2	*	0	0	1.4	1.5	2.1	1.6	1.1	0.6
Ag'l Credit	=	22.4	6.7	11.1	1.0	18.4	7.1	2.2	2.3	6.8	10.8	5.2	6.1
Ag'l Marketing	=	0.4	1.0	0.7	0.4	0.4	2.8	3.9	4.5	6.2	2.5	1.6	0.5
Agribusiness	=	17.4	7.5	35.7	0.8	6.0	3.1	4.2	4	6.8	11.9	0.4	1.3
Infrastructure (Rural Roads)	=	4.7	2.6	10.5	3.7	2.8	9.2	1.5	2.3	25.8	2.8	2.9	3.2
NATURAL RESOURCES/ ENVIRONMENT (total)		15.4	7.0	6.1	1.6	27.3	24.5	30.4	27.6	12.6	16.8	22.0	18.2
Forestry	=	1.8	5.6	3.1	0.8	9.1	8.2	12.3	14.6	9.8	6.0	7.0	5.1
Environmental Mgmt., Planning/Policy	=	2.9	0.8	2.4	0.7	9.9	10.4	9.3	4.6	1.6	7.4	9.4	5.1
Soils	=	0.1	0.6	0.6	0.1	0.5	0.1	1.0	1.4	0	1.1	1.8	1.0
Ag'l Land Development	=	0	0	0	0	3.8	3.9	6.9	5.8	0.3	*	0.1	0.1
Water Resources Mgmt.	=	0	0	0	0	1.8	0.1	0	0	0.9	2.3	3.5	6.7
Energy (Fuelwood)	=	10.6	0	0	0	2.2	1.6	0.9	1.2	0	0	0.2	0.2
NARCOTIC AWARENESS	=	0	0	0	83.4	0	0	0	0	0	0	0	0
GRAND TOTALS	=	100	100	100	100	100	100	100	100	100	100	100	100

a) For South America FY91, percentages (if not include Narcotic Awareness; for research, extension, and education are 16.2%, 24.0%, and 1.7%, respectively.

Table 2.7. Trends in LAC ARDN Funding for Agricultural Research, Extension, and Education: Comparison Across Subregions.

	Research			Extension			Education		
	AR	CA	CN	AR	CA	CN	AR	CA	CN
	%			%			%		
FY88	16.3	15.6	8.3	15.9	10.3	17.4	4.0	5.5	0.0
FY89	26.6	3.6	10.4	28.9	7.7	20.0	6.0	10.3	5.8
FY90	12.3	3.6	23.2	16.9	4.5	17.9	1.4	0.9	6.1
FY91	2.7	0.5	24.7	4.0	2.4	21.3	0.3	0.8	3.9

Key: AR = Andean Region; CA = Central America; CN = Caribbean Region

Source: Table 2.6.

Table 2.8 provides subregional comparisons of the trends in LAC ARDN funding for Ag REE. The Andean and Central American regions experienced similar downward trends in funding for Ag REE. In the Central American region, ARDN funding for education fell by 85%, research by 97%, and extension by 77%, while ARDN funding in the Andean region fell 93% for education, 84% for research, and 75% for extension. As a result, ARDN funding for Ag REE now comprises only 7% of the Andean portfolio and less than 4% of the Central American portfolio. Only the Caribbean region experienced an increase in ARDN funding, with funding for education going from 0% to nearly 4% of the ARDN portfolio in the region, research increasing by nearly threefold (from 8.3% to 24.7%), and extension increasing by over 20% (from 17.4% to 21.3%).

Table 2.8. Subregional Trends in LAC ARDN Funding for Agricultural Research, Extension, and Education by Subregion: Comparison Across Categories for Each Subregion.

	Andean			Caribbean			Central America		
	RES	EXT	EDU	RES	EXT	EDU	RES	EXT	EDU
	%			%			%		
FY88	16.3	15.9	4.0	8.3	17.4	0.0	15.6	10.3	5.5
FY89	26.6	28.9	6.0	10.4	20.0	5.8	3.6	7.7	10.3
FY90	12.3	16.9	1.4	23.2	17.9	6.1	3.6	4.5	0.9
FY91	2.7	4.0	0.3	24.7	21.3	3.9	0.5	2.4	0.8

Source: Table 2.6.

3. Funding Trends by Country within Subregions

Table 2.9 summarizes, by country in each subregion, FY89 ARDN funding for Ag REE. The reader should note that the data are for a single year (FY89) and that project obligations generally are lumpy (i.e. the level of funding obligated for any particular year may be higher or lower than the preceding or following years). A more reliable indicator would be funding over the life of a project (LOP) or, alternatively, a multi-year average for Ag REE-related project obligations. Thus, the present data only estimate the funding trend. With this caution in mind, LAC Missions can be ranked in terms of the relative emphasis placed on agricultural research, extension, and education, as measured by ARDN obligations for Ag REE as a percent of total ARDN obligations (last column, Table 2.9).

Research—The Mission ranking is as follows:

%	Country	%	Country
36.3	Perú	13.2	Jamaica
21.2	Bolivia	9.2	Belize
17.0	Ecuador	4.6	ROCAP
16.4	RDO/C	1.4	Guatemala
16.3	Dominican Republic	0.0	Haiti
13.6	Honduras	0.0	El Salvador
		0.0	Costa Rica

Comparing USAID Missions across the three subregions, the three Andean Missions place the highest emphasis on agricultural research, with an average of almost 25% of the ARDN portfolio invested in agricultural research; only USAID/Perú invests more than 35% of ARDN resources in research. The Caribbean Missions fall in the middle of the range. Including Haiti (which does not invest any ARDN resources in research), Caribbean Missions invest an average of about 11% of ARDN resources in research. The Central American Missions fall at the bottom of the range, investing an average of about 5% of the ARDN resources in research, although this figure includes two Missions (El Salvador and Costa Rica) that do not invest any ARDN resources in research.

Extension—The Mission ranking is as follows:

%	Country	%	Country
32.7	Ecuador	16.0	RDO/C
31.9	Haiti	10.2	Honduras
31.6	Perú	9.0	ROCAP
26.7	Belize	6.9	Guatemala
23.5	Bolivia	6.7	El Salvador
20.4	Jamaica	5.8	Dominican Republic
		0.0	Costa Rica

Table 2.9. FY89 ARDN Funding for Agricultural Research, Extension, and Education by Country in Each LAC Subregion: $'000.

LAC SUBREGIONS	TOTAL ARDN	RESEARCH ($'000)	RESEARCH (%)	EXTENSION ($'000)	EXTENSION (%)	EDUCATION ($'000)	EDUCATION (%)	TOTAL REE ($'000)	TOTAL REE (%)
ANDEAN REGION									
Bolivia	6586	1397	21.2	1547	23.5	0	0	2944	44.7
Ecuador	3943	670	17.0	1288	32.7	125	3.2	2083	52.8
Perú	7619	2763	36.3	2410	31.6	971	12.7	6144	80.6
	18148	4830	26.6	5245	28.9	1096	6.0	11171	61.6
CARIBBEAN									
Dominican Republic	6921	1131	16.3	403	5.8	1800	26.0	3334	48.2
Haiti	9386	0	0	2997	31.9	0	0	2997	31.9
Jamaica	10191	1350	13.2	2085	20.4	0	0	3435	33.7
RDO/C	4742	780	16.4	758	16.0	0	0	1538	32.4
	31240	3261	10.4	6243	20.0	1800	5.8	11304	36.2
CENTRAL AMERICA									
Belize	2271	210	9.2	606	26.7	0	0	816	35.9
Costa Rica	7050	0	0	0	0	0	0	0	0
El Salvador	20930	0	0	1412	6.7	0	0	1412	6.7
Guatemala	38255	550	1.4	2659	6.9	280	.7	3489	9.1
Honduras	15375	2090	13.6	1566	10.2	150	.5	3806	24.7
ROCAP	23659	1091	4.6	2122	9.0	10757	45.5	13970	59.0
C. A. Regional	1319	30	2.3	30	2.3	39	3.0	99	7.5
	108859	3971	3.6	8395	7.7	11226	10.3	23592	21.7
LAC REGIONAL	2495	14	.6	14	.6	334	13.4	362	14.5
GRAND TOTALS	160742	12076	7.5	19897	12.4	14456	9.0	46429	28.9

Source: LAC/DR/RD

Comparing across the three subregions, three of the top five ranks are held by the three Andean Missions, with Ecuador ranked first, Perú third, and Bolivia fifth; together, the Andean Missions invest an average of 29% of their ARDN resources in extension. The Caribbean Missions fall in the middle of the range, averaging about 18%; however, overall, Haiti ranks second at nearly 32% and the Dominican Republic ranks next to last at almost 6%. The Central American Missions fall at the bottom of the range, averaging just under 10%.

Education—The Mission ranking is as follows:

%	Country	%	Country
45.5	ROCAP	0.0	Bolivia
26.0	Dominican Republic	0.0	Haiti
12.7	Perú	0.0	Jamaica
3.2	Ecuador	0.0	RDO/C
0.7	Guatemala	0.0	El Salvador
0.5	Honduras	0.0	Belize
		0.0	Costa Rica

Comparing USAID Missions across the three subregions, two of the top five Missions (Perú at 13% and Ecuador at 3%) are Andean Missions; on the other hand, the USAID/Bolivia Mission invests 0% of its ARDN resources in education. In the Caribbean region, USAID/Dominican Republic invests 26% of its ARDN resources in education, while the other three Caribbean Missions (Haiti, Jamaica, and RDO/C) invest none of their ARDN resources in education. In the Central American region, ROCAP invests almost half (45.5%) of its ARDN resources in education, while the five country-level Central American Missions invest little or none of their ARDN resources in agricultural education.

Overall—In terms of all three Ag REE functions, the country ranking is as follows:

%	Country	%	Country
80.6	Perú	33.7	Jamaica
59.0	ROCAP	32.4	RDO/C
52.8	Ecuador	31.9	Haiti
48.2	Dominican Republic	24.7	Honduras
44.7	Bolivia	9.1	Guatemala
35.9	Belize	6.7	El Salvador
		0.0	Costa Rica

Generally, the Andean region Missions invest almost 60% of their ARDN resources on Ag REE, USAID/Perú (at 81%) placing first among all LAC countries, Ecuador third (53%) and Bolivia fifth (45%). By comparison, the Central American Missions invest an average of about 22%, with ROCAP (at 59%) second among all LAC Missions and USAID/Costa Rica (at 0%) last. The Caribbean Missions fall in the middle range, averaging about 37% of ARDN resources invested in Ag REE, although USAID/Dominican Republic invests nearly half (48%) of its ARDN resources in Ag REE.

The regional patterns for agricultural research, extension, and education are summarized in Table 2.10.

Table. 2.10. Regional Pattern of USAID Mission Investment in Ag REE as a Percent of FY89 ARDN Resources.

	Andean	Caribbean	Central American
	%		
Research	24.8	11.5	4.8
Extension	29.3	18.5	9.9
Education	5.3	6.5	7.8
Overall REE	59.4	36.6	22.6

4. Major Trends

Box 2.1 summarizes the major changes in the LAC ARDN portfolio during the subject period (FY88-FY91). In summary, on a subregional basis, Ag REE funding, as a percent of total ARDN funding, fell dramatically in two regions (from 36% to 7% in the Andean region and from 31% to 4% in the Central American region) and increased dramatically in one region (from 26% to 50% in the Caribbean region). Some of the major trends in the LAC ARDN portfolio are graphically shown in Figure 2.3. The decline in ARDN funding for Ag REE and agricultural credit are apparent, while the increase in ARDN funding for agribusiness, agricultural policy and, more recently, narcotics awareness are similarly evident.

B. Other Donor Funding & Activity for LAC Ag REE-Strengthening

Beyond AID's ARDN funding for Ag REE, others donors also are doing very little to strengthen LAC Ag REE systems.

1. Donor Support for International Agricultural Research Center (IARCs)

AID has been one of the principal donors to International Agricultural Research Centers through the Agency's participation in the Consultative Group on International Agricultural Research (CGIAR) that coordinates donor funding of the IARC

Box 2.1. Summary of the Major Changes in the LAC ARDN Portfolio during FY88-FY91.

Andean Region

* Overall, ARDN funding for agriculture and natural resources/environment fell dramatically, from 84.6% to 14.9% and 15.4% to 1.6%, respectively. On the other hand, narcotics awareness funding, in a single year (FY91) will increase from 0% (in previous years) to 83.4% of the regional portfolio in FY91.

* ARDN funding for Ag REE fell from 36% to 7% of the regional portfolio.

* Other areas experiencing major decreases in spending were: agricultural credit (down from 22.4% to 1%), fuelwood (energy) (down from 10.6% to 0%), and agribusiness (down from 17.4% to .8%).

Caribbean Region

* Overall, ARDN funding for agriculture fell slightly (72.7% to 72.4%), while funding for natural resources/environment rose slightly (27.3% to 27.6%).

* ARDN funding for Ag REE rose from 25.7% to 50% (49.9%) of the regional portfolio.

* Areas in which there were major decreases in spending were: agricultural irrigation (down from 14.8% to .5%) and agricultural credit (down from 18.4% to 2.3%).

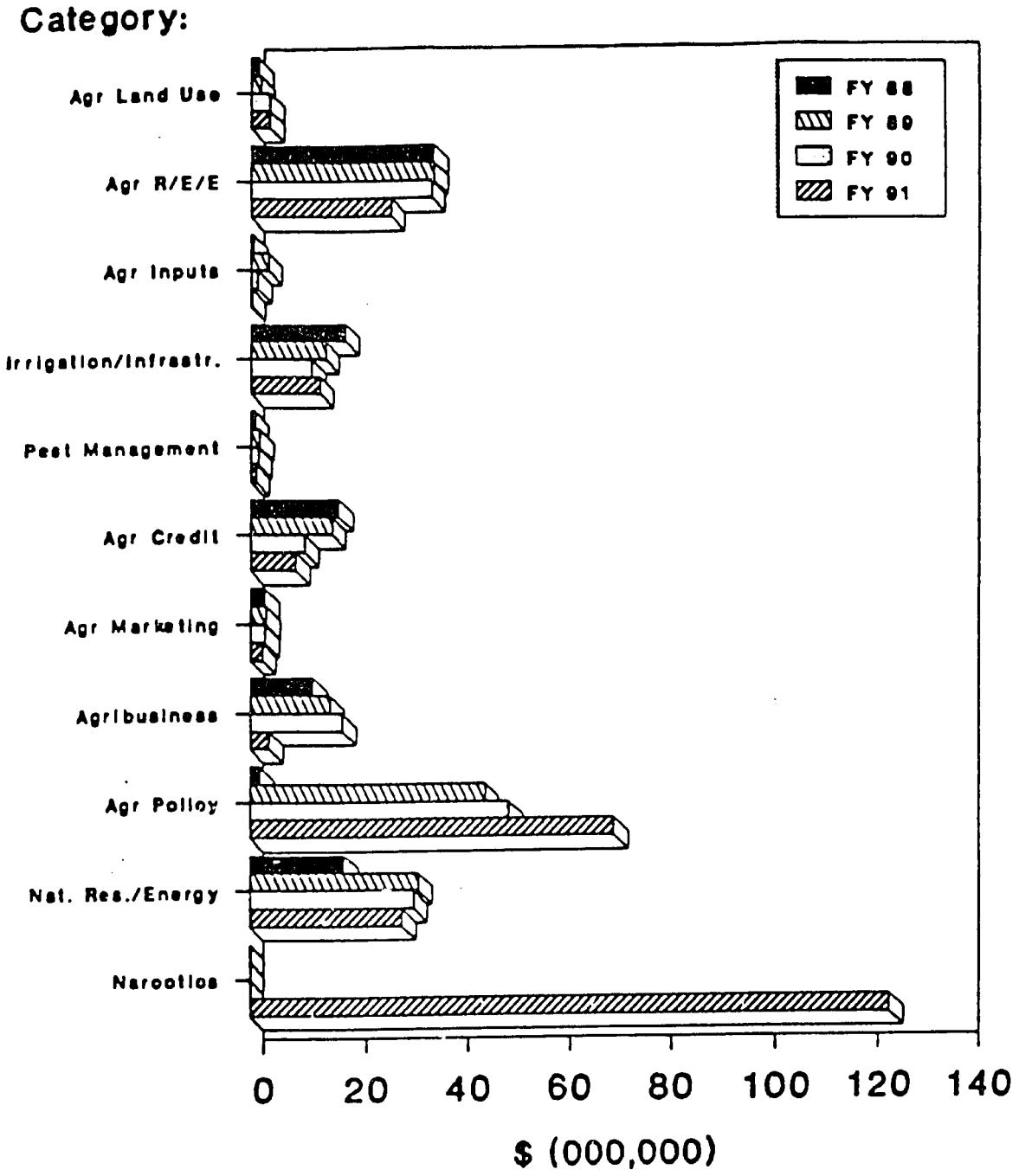
Central American Region

* Overall, ARDN funding for agriculture fell slightly from 87.4% to 81.7%, while funding for natural resources and the environment rose from 12.6% to 18.2%; thus, a 5.7% decline in agriculture was balanced by a 5.6% increase in natural resources and the environment.

* ARDN funding for Ag REE fell from 31.4% to 3.7% of the regional portfolio.

* Funding for infrastructure fell from 25.8% to 3.2%, while funding for agricultural policy rose from 2.3% to 61% of the regional portfolio.

Figure 2.3. LAC Bureau ARDN Portfolio Summary by Strategic Funding Categories.



Source: LAC/DR/RD (note: based on FY89 as of late 1989)

system. There are three IARCs in the LAC region: CIAT, CIMMYT, and CIP. These IARCs, in turn, work with the national agricultural research systems (NARS). During the period 1983-89, AID support for the LAC IARCs fell from US$ 13.8 million to less than US$ 12.66 million, a decline of over 7.5% (Table 2.11).

By comparison, Inter-American Development Bank (IDB) grant funding for the LAC IARCs has grown from US$ 9.1 million in 1983 to US$ 11.49 million in 1989, an increase of more than 26%. A recent IDB grant of $11.5 million, the latest in a series of annual contributions the IDB has made to the LAC IARCs since 1974, marks the start of a new approach in the Bank's support of the IARCs. In the past, IDB funds financed the core budgets of the IARCs. Beginning in 1990, $360,000 of the Bank's grant was to fund the preparation of special programs targeted on the specific needs of the IDB's member countries, primarily in applied research and training. Over the four-year grant period, about 60% of the Bank's contributions to the IARCs will finance these special programs, the remaining 40% providing budgetary support. Research activities will involve collaboration between the IARCs and the NARS. Depending on funding availability, the Bank is expected to approve about ten special programs during the grant period. The Bank also has provided that up to 10% of its funding can be used for special programs important to the region but conducted by IARCs outside the LAC region. Currently IDB is working with CARDI on development of IDB financing to develop capability (training) in support of agriculture.

As USAID Mission ARDN funding for Ag REE in the LAC region has declined, the Agency's funding of the LAC IARCs, even though this funding also declined, has become more and more important, since the NARS rely on the IARCs as a principal source of scientific expertise (e.g., research methodology), technological innovation (e.g. germ plasm), and training support (e.g., specialized short courses). At the same time, government funding for public sector Ag REE institutions in AID-assisted LAC countries declined during the 1980s. But the decline in host country government and AID funding for public sector Ag REE institutions contributed to a deterioration in the capacity of these institutions to carry out TG&T.

Indeed, a 1990 survey of LAC USAID Missions found that several key components of host-country public agricultural research organizations (budget, numbers trained, personnel management, and program planning) were, on average, rated as poor or very poor (Table 4.3, Chapter 4). The Missions also rated private sector research organizations as having made the most progress in TG&T during the 1980s. This area's average progress rating was 69%, the progress of public research organizations was rated at 55%, while public extension and agricultural education were rated at 51% and 45% respectively.

Table 2.11. U.S. Agency for International Development (USAID) and Inter-American Development Bank (IDB) Grant Funding to LAC International Agricultural Research Centers (IARCs).

	USAID				IDB	
Year	CIMMYT	CIAT	CIP	Total	Total	Total
	US$ Million				US$ Million	
1974	-	-	-		2.0	
1975	-	-	-		4.0	
1976	-	-	-	10.7		
1977	-	-	-	6.2		
1978	-	-	-	6.2		
1979	-	-	-	6.7		
1980	-	-	-	7.4		
1981	-	-	-	8.1		
1982	-	-	-	9.1		
1983	6.00	5.40	2.30	13.7	9.1	22.8
1984	6.00	5.60	2.30	13.9	9.1	23.0
1985	6.00	5.54	2.30	13.84	9.74	23.58
1986	6.10	5.60	2.33	14.03	9.64	23.67
1987	5.25	4.82	2.00	12.07	10.28	22.35
1988	5.25	4.82	2.05	12.[illegible]	10.53	22.65
1989 (est.)	5.25	5.36	2.05	12.66	11.49	24.15

Source: CGIAR Secretariat and Inter-American Development Bank

The decline in TG&T capacity of public agricultural research institutions, in turn, weakened their ability to link effectively not only with the LAC IARCs (CIMMYT, CIAT, and CIP) but also with the LAC regional agricultural research centers (RARCs): the Tropical Agricultural Research and Training Center (CATIE) in Costa Rica and the Caribbean Agricultural Research and Development Institute (CARDI) in Trinidad. Faced by the deteriorating TG&T capacity of national-level Ag REE systems, IARCs and RARCs are finding it increasingly difficult to implement TG&T programs in collaboration with the NARS. This became a point of discussion during AID's 1990 International Centers Day. As the *BIFAD Briefs* reported, the discussions during Centers Day raised the issue of:

> the need for improving host-country institutional capacity and leadership in adaptive research and extension, in order to [ensure] adoption by farmers of new and improved technology. The IARCs recognized that they cannot be successful without viable national research and diffusion systems in the countries they serve.

> The stagnant or declining public institutional capacity for research and extension in developing countries, especially in Africa and Latin America, also was noted, and the national capacity to sustain support of their public institutions without foreign aid was questioned. AID and the IARC participants wrestled with defining their organizations' appropriate roles and those of other donors and the host countries in reversing this trend....
>
> Unless public research and extension institutions are supported,...rural economies will stagnate and the natural resource base for sustainable agriculture will deteriorate further, resulting in decreased food yields (BIFAD, 1991:6).

Deterioration of public TG&T capacity has also sparked an increased interest among the IARCs in establishing collaborative links with private sector research groups, i.e., with non-governmental organizations (NGOs) and private voluntary organizations (PVOs). However, such private agricultural research organizations generally focus on different crops (i.e., nontraditional agricultural export crops) than those (i.e., basic food crops) falling within the research mandates of an IARC or a NARS. This raises the question of whether increased reliance of LAC IARCs on collaborative links with private research organizations, and decreased reliance on public agricultural research organizations, would further weaken both public and private research organizations. That is, would such a trend further accelerate the decline of public sector research on basic food crops, while distracting private research organizations from their mandate to focus on NTAE crops?

2. Donor Support for NARS

a. World Bank

Lending by the World Bank in the LAC region during 1981-87 for free-standing agricultural research projects and agricultural and regional development (ARD) projects with research components included six projects in four AID-assisted countries: Barbados, Haiti, Jamaica, and Perú (Table 2.12). The cost of the agricultural research components in these Bank projects, as a percentage of total project cost, averaged 15% for the region, while project research costs in the four AID-assisted countries as a percentage of total project cost was only 5.2%. Although Bank lending (loan/credit) amounted to 40.4% of total project cost, the cost of a project's research component as a percentage of total project cost was 0.49%. Further, the Bank provides an extremely small portion of its lending to LAC countries receiving AID assistance, most lending being targeted on non-AID-assisted countries such as Brazil and Mexico; only a small percentage of lending is actually allocated to research.

These figures reflect a downward trend since the 1960s in Bank funding for agricultural research. During the years (1968 to 1981) that Robert McNamara directed the World Bank it dedicated a significant proportion of its budgets for loans to finance ARD projects, with a fifth of the loans going to LAC countries. These loans were important because they partially corrected the tendency of many LAC countries to underinvest in their own agricultural and rural sectors.

Table 2.12. World Bank-Assisted Projects with Agricultural Research Components in the LAC Region (1981-1987) (source: Pritchard, 1990).

Key: Countries in **bold** are AID-assisted countries.

A = **Barbados**	F = **Jamaica**
B = Brazil	G = Mexico
C = Colombia	H = Paraguay
D = Guyana	I = **Perú**
E = **Haiti**	

Year	Total	LAC	%	Countries (# of Projects)
1981	32	4	12.5	B (3), G (1)
1982	27	8	29.6	B (4), G (1), H (2), **I** (1) a/
1983	36	4	11.1	B (1), G (1), C (1), **I** (1) b/
1984	32	5	15.6	B (1), C (1), **E** (1), **F** (1), **I** (1) c/
1985	39	4	10.3	B (2), G (1), D (1)
1986	28	3	10.7	B (2), G (1)
1987	36	8	22.2	B (6), G (1), **A** (1) d/

Notes:

a/ 1982: Perú (Agricultural Research & Extension, cost of project's research component: $21.7 million, 26% of project's total cost).

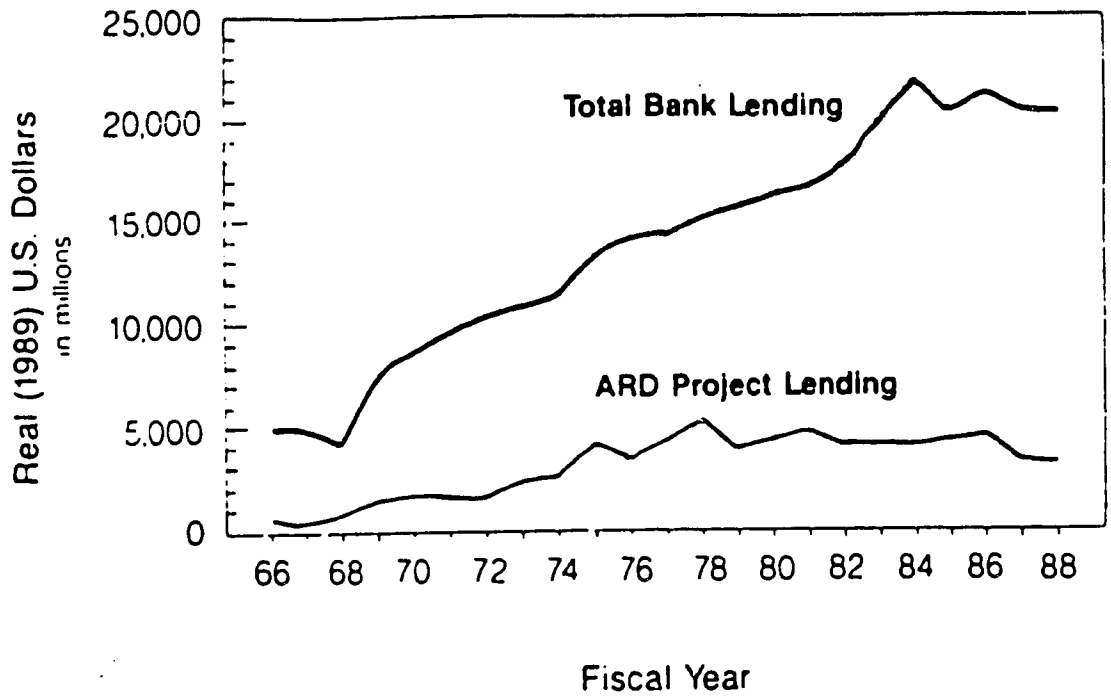
b/ 1983: Perú (Alto Ways Rural Development, cost of project's research component: $3.7 million, 4.4% of total project cost).

c/ 1984: Haiti (Rural Development II, cost of project's research component: $2.7 million, 9.3% of total project cost); Jamaica (Export Crops I, cost of project's research component: $0.6 million, 1.5% of total project cost); and Perú (Rural Dev III, cost of project's research component: $1.5 million, 2.2% of total project cost).

d/ 1987: Barbados (Ag Development Rehabilitation-A, cost of project's research component: $0.2 million, 3.4% of total project cost).

However, when McNamara left the Bank in 1981, it began to cut the actual value of the loans for ARD projects. McNamara's successor, A.W. Clausen, emphasized structural readjustment and the LAC debt crisis; policy reform, market reform, and privatization became the road to development. Since 1980, the portion of the Bank's loans directed to ARD projects has decreased almost by half, with the real value of ARD loans falling to almost 20 percent (see Figure 2.4). The Bank believed that it had discovered a better means to help the agricultural sector: structural adjustment loans (SALs). It was expected that these loans would benefit farmers because the loans were tied to policy changes such as currency devaluation, reduction in governmental subsidies and protection, and the introduction of price reforms and market-determined exchange rates.

Figure 2.4. World Bank Lending, 1966-1988.



Source World Bank, 19[illegible] and 1989 (as reported in Paarlberg and Lipton, 1991).

During the 1980s, the Bank did not emphasize ARD projects that disburse money slowly, but rather the SALs that disburse money more quickly, with conditions for the implementation of specified policy reforms. Thus, a reduced amount of money has been available for ARD projects. At the same time, the structural adjustment program may have hurt more than helped farmers. Under pressure to reduce national budgets, many developing country governments chose to cut public investments for agriculture rather than touch urban and industrial subsidies. Many governments found it easier to cut subsidies (that is, raise the price of rural credit and inputs such as fertilizer, and cut the budgets for agricultural research and extension) than to raise commodity prices.

With the passage of time, the LAC countries were under pressure to repay the interest on their loans and pay import bills during a long and deep recession. This pressure led the Bank to put even greater emphasis on the sectoral adjustment loans (SECALs), thereby cutting even further the amount of money available for ARD projects. In the process, the Bank began to depend more and more on generalists and trade economists, and less and less on agricultural technicians and agricultural economists. Toward the mid-1980s, when the principal donors put pressure on the Bank to reduce operational costs, the Bank responded by reducing its technical personnel in agriculture.

With the beginning of the 1990s, the Bank is recognizing that a rural investment crisis has been imposed on the previous structural adjustment crisis, especially in Africa and Latin America. The Bank has begun to look for ways to increase public sector investment in agriculture in the Bank's borrowing countries. For example, the Bank now offers what are called "hybrid" loans, which combine structural adjustment support that disburses rapidly and project support that disburses slowly. The Bank also is pushing other means to increase public expenditures on the agricultural sector. For example, the Bank has made an SAL loan to Mexico that was conditioned on the Mexican government increasing its level of public sector funding support for agriculture.

Paarlberg and Lipton (1991) clarify that the change in the Bank's pattern of lending had as a consequence that the Bank not only disburses money but also, by way of example, defines the development agenda. That is, any change in the Bank's policies reverberates outward to the multilateral institutions, international assistance agencies, and national development ministries. Thus, they conclude that:

> If the World Bank fails to revive its project lending for agricultural and rural development in the 1990s, no other competent lending institution will be ready and able to take its place.... The Inter-American Development Bank...followed the lead of the World Bank in the 1980s and permitted lending for agriculture to fall (Paarlberg and Lipton, 1991:495).

They also emphasize that it is not clear that bilateral assistance is ready to fill the vacuum created if the Bank does not provide financing for projects aimed at strengthening agricultural technology systems in the LAC region. On the other hand, private investments in LAC agriculture have favored a few highly profitable commercial subsectors (e.g., horticulture and agroprocessing) and this tendency is not likely to change.

Some would maintain that without a rebirth of leadership on the part of the Bank, developing country governments may have the will but not the capacity to invest in agricultural and rural development. With respect to this, Paarlberg and Lipton (1991:496) write that as World Bank ARD lending

> declined in the 1980s, so did Third World governmental outlays—by about $45 billion per year, according to estimates by the U.N. Food and Agriculture Organization. In Latin America, agriculture's already small share of central government expenditures fell by 35% in the early 1980s. By allowing its own lending for agricultural and rural development to falter over the past decade, the Bank may have legitimized an

unfortunate tendency in the same direction among Third World governments as well as multilateral and bilateral funding sources.

The reduction in public expenditures for agriculture had a negative impact on the capacity of Ag REE systems to generate and transfer agricultural technology. As earlier noted, the real expenditures per agricultural researcher fell by 8.3 percent in 20 LAC countries between 1961-65 and 1981-85 (Pardey and Roseboom, 1990:2-4).

b. International Service for National Agricultural Research (ISNAR)

Donors also provide funding for the International Service for National Agricultural Research (ISNAR). But ISNAR has provided only limited technical support for Ag REE-strengthening of National Agricultural Research Systems (NARS) in AID-assisted LAC countries. Table 2.13 summarizes ISNAR's LAC collaboration, including the exploratory (initial) Mission to country, system review, system planning, and implementation of system improvements. The boundaries between the planning and implementation phases are not always clear; most of the time ISNAR works on various critical factors simultaneously, with the phases overlapping. While work on some factors is in the planning stage, others are in the implementation stage.

ISNAR has done NARS reviews in five AID-assisted LAC countries (Bolivia, Ecuador, Perú, Dominican Republic, Panamá) and exploratory reviews in Costa Rica and Haiti. ISNAR has collaborated in planning and implementation of NARS improvements in four countries (Bolivia, Ecuador, Dominican Republic, and Costa Rica). Table 2.14 summarizes specific ISNAR activities in individual LAC countries to date, while Box 2.2 identifies ISNAR activities in AID-assisted LAC countries during 1989.

In 1989, ISNAR sponsored several regional training and international workshop events, and two regional training programs were conducted. At CATIE (Costa Rica), IICA, CATIE, and ISNAR sponsored a workshop on Agricultural Research Management, attended by 20 high- and mid-level managers from 10 LAC countries, of which nine were AID-assisted: Bolivia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, and Panamá. In Chile, FAO, IICA, ISNAR and INIA (Chile) sponsored a training program on research management. Three ISNAR staff contributed topics on research management: innovation, private-sector linkages, and monitoring and evaluation, plus a paper on basics of biotechnology. Participants attended from Chile and three AID-assisted LAC countries: Bolivia, Ecuador, and Perú.

ISNAR sponsored three international workshops at ISNAR's headquarters in The Hague, Netherlands. The International Agricultural Research Management Workshop (IARM) was conducted for senior NARS managers (7 from the LAC region). This workshop focused on three management areas: planning and priority setting, structure and organization, and program budgeting and management information. The Agricultural Researcher Information System (ARIS) workshop, which included participation of two AID-assisted LAC countries (Costa Rica and Ecuador), focused on helping research managers to learn how to use a human resource questionnaire and database program to quickly process

Box 2.2. Summary of 1989 ISNAR Activities in the LAC Region.

ANDEAN

Bolivia—Diagnostic review of IBTA; attendance of Bolivians at two regional workshops: Agricultural Research Management (ARM), CATIE, Costa Rica; and Regional Research Management, Chile), and at two international workshops: International Agricultural Research Management (IARM) and Making the Link, The Hague.

Ecuador—Assisted in gathering and analyzing data on human resources for INIAP; INIAP's director of human resources spent a month at ISNAR planning a system for human resource management and development. Ecuadorian staff took part in two regional workshops (CATIE and Chile) and three international workshops (IARM, ARIS, and Making the Link).

Perú—ISNAR staff member took part in Perú's annual conference on agricultural research; Peruvians took part in the Regional Research Management workshop in Chile.

CARIBBEAN

Dominican Republic—Hosted a case study in the research-technology transfer linkage study. Dominicans attended the CATIE ARM and Making the Link workshops.

CENTRAL AMERICA

Costa Rica—ISNAR staff provided technical assistance to the National Commission for Research and Transfer of Agricultural Technology. Participated in a workshop for planning the 1990 research program, making presentations on systems for planning, monitoring, and evaluating integrated research and transfer components of national programs, and centers and data banks of scientific-technical information in the agricultural sector). Advised Costa Rica's new National Commission for Research and Transfer of Agricultural Technology on evaluating performance of national research programs. A case study was done on the research-technology transfer linkage. Costa Ricans participated in the CATIE ARM workshop and in two international workshops: Agricultural Researcher Information System (ARIS) and Making the Link.

Guatemala—Guatemalans participated in the Making the Link workshop and in the CATIE ARM workshop.

Honduras—Honduras participated in the CATIE ARM workshop and will participate in a case study of small country NARS.

Table 2.13. ISNAR Activities (Reviews of NARS and Collaboration in Research Planning and Implementation) in the LAC Region through 1990) (Source: Carlos Valverde, ISNAR).

AID-ASSISTED LAC COUNTRIES	Country Request	Initial Mission	System Review	Research Planning	Implementation
ANDEAN REGION					
Bolivia	• (83)	• (89)	• (89)	• (90)	• (91)
Ecuador	• (84)	• (87)	• (88)	• (89)	• (91)
Perú	• (85)		• (85)		
CARIBBEAN REGION					
Dominican Republic	• (82)	• (83)	• (83)	• (84)	• (86)
Haiti	• (83)	• (83)	• (83)1/		
Jamaica	• (90)				
CARDI (E.Caribbean)	• (84)	• (85)	• (85)	• (90)	• (91)
CENTRAL AMERICA					
Belize					
Costa Rica	• (81)	• (81)	•(81/87)	• (89)	• ( )
El Salvador					
Guatemala	• (86)				
Honduras	• (83)				
Nicaragua					
Panamá	• (83)	• (85)	• (85)	• (86)	
OTHER LAC COUNTRIES					
Argentina	• (84)			• (85)	• (88)3/
Brazil					
Chile	• (80)	• (86)		• (87)	• (88) 4/
Colombia	• (84)	• (85)		• (85)	• 3/
Guyana	• (81)	• (82)	• (82)		
Mexico	• (87)				
Paraguay					
Suriname	• 36)				
Uruguay	• (85)	• (86)	• (86)2/	• (86)	• (91)
Venezuela	• (91)				

KEY: 1, 2 = Only exploratory review
3 = Only system component
4 = Only training

Table 2.14. ISNAR Collaboration with National Agricultural Research Systems (NARS) in System-Building Activities (Source: Carlos Valverde, ISNAR).

System-Building Activities	Bolivia	Ecuador	Perú	Dominican Republic	Costa Rica	Colombia	Uruguay
Structure & Organization	●	●	●	●	●		●
National Research Priorities	●	●		●	●		●
Program Formulation & Budgeting				●			
Monitoring & Evaluation				●		●	
Link NARS & Policymakers		●					●
Link NARS & Technology Transfer		●	●	●	●		
Link NARS & Knowledge Sources							
Human Resources		●		●	●		●
Physical Resources					●		
Financial Resources					●		
MIS							

human resource information. A workshop called Making the Link Between Agricultural Research and Technology Transfer identified and discussed lessons learned from two ISNAR studies [On-Farm Client-Oriented Research (OFCOR) and Research-Technology Transfer Linkages (RTTL)]. AID-assisted LAC countries participating were Bolivia, Ecuador, Dominican Republic, Costa Rica, and Guatemala.

3. Limits of Strengthening NARS through IARCs

Despite ISNAR's progress in strengthening NARS in AID-assisted LAC countries, the CGIAR is concerned about the weakened capability of the NARS to collaborate with the IARCs, and has directed its Technical Advisory Committee (TAC) to develop a background paper on "Relationships Between CGIAR Centres and National Research Systems: Issues and Options" (CGIAR, 1991). In this paper, the TAC notes that IARC activities cannot be effective:

> unless there is a certain minimum capacity within the national system to do research, as well as to establish effective linkages both with the Centres and with local producers through the extension services. Where this minimum capacity is lacking, the Centres have sometimes collaborated with bilateral donors in the provision of research assistance [defined as including financial assistance, technical assistance, etc.], rather than face the frustration of not being able to transfer the benefits of their work (CGIAR, 1991:6).

But the TAC states that:

> Only the Group [CGIAR], itself, can determine the role it wishes to play in this whole area of activity [i.e., "issue of strengthening national research systems"]. In particular, it must enunciate its preferences for the extent to which the Centres it funds should become involved in direct support for national systems, and the ways in which they might do so (CGIAR, 1991:6).

The TAC further states that while "there is general recognition of the need for research assistance to national institutions to reinforce Centre activities, a recurring issue in the CGIAR has been the extent to which the Centres themselves should become involved in providing and administering it" (CGIAR, 1991: 9). The TAC notes that the IARCs have created research networks that have played a role in providing national programs access to development assistance. But the TAC also notes that:

> As a consequence, the increasing calls on the time of national scientists are not necessarily determined by their own national priorities. The driving force may be supply, rather than demand. Furthermore, active promotion of cooperative and contract research by the Centres might serve only to aggravate the problem.... As far as cooperative networks are concerned, if they are to be successful and sustainable, there is no viable alternative to a demand-driven system in which the countries themselves define the problems and determine the priorities. It is the orchestration of CGIAR involvement in all these activities to which further thought must be given and appropriate action taken (CGIAR, 1991:13).

Finally, the TAC notes that IARCs, including ISNAR, play or could play a role in providing research assistance (technical and/or financial assistance) aimed at strengthening national (public and/or private) agricultural research systems. But the TAC clearly states: "If there is a desire to link Centre activities more closely to research assistance, an alternative approach would be to give more explicit recognition to this need, and to modify the structure of some or all of the Centres accordingly" (CGIAR, 1991:6).

The TAC proposes the possibility of establishing "a research assistance agency as a separate unit" at some or all of the IARCs. Such an agency would be controlled by the IARC's board but would have a separate budget and be "entirely self-funding, by charging appropriate overhead costs" on all research assistance it administered. Research assistance would be managed by "full-time specialists" rather than by international scientists on a part-time basis, as often happens at present.

> The research assistance unit could draw on Centre programme staff on a paid consultancy basis, thus maintaining the integrity of the core funding. Some restructuring of existing Centres along these lines would not be difficult. In some instances, it would amount to little more than reorganizing the units that already exist at some Centres, which currently operate under such titles as "international cooperation programmes (CGIAR, 1991:11-12).

Some would argue that asking IARCs to assume a major leadership role for strengthening NARS distorts the whole purpose of the IARCS: to provide leadership in identifying and attacking major problems restricting efficient production of specific commodities. In this view, IARCs should stick to doing what they can do best, namely, helping NARS through: (a) literature; (b) germ plasm; (c) training; (d) role models; and (e) influencing national policy makers.

Perhaps an expansion in ISNAR operations could most effectively address the issue, with ISNAR drawing consultants from IARCs, other research institutes, universities, and private sector firms, to meet the spectrum of policy, managerial, administrative, and technical problems of NARS. ISNAR also could refer specific projects to the World Bank, regional development banks, USAID, and other national development assistance programs.

Beyond these points, several questions can be posed regarding the ideas outlined by the TAC Secretariat:

- Re the reference to NARS lacking "minimum capacity," why do the NARS lack capacity despite all the money, technical assistance, training, etc. expended? What, if anything, can the IARCs do about these factors—national policies, lack of funds, civil service systems, etc.?

- Re the referenced "research assistance agency," was not the CGIAR's principal objective in establishing ISNAR that of "strengthening" NARS? Would not such an agency be successful only by working in behalf of all the IARCs? Would each IARC's "research assistance agency" operate independently of other IARC research assistance agencies, or would each IARC's research assistance agency be affiliated

with an overreaching agency (e.g., ISNAR)? How would the agency address problems of NARS with commodities not represented by any IARC?

- Re the referenced "self-funding," where would the funding originate for direct, indirect, and overhead expenditures? To what extent is ISNAR's budget self-funded? How would a donor decide where a dollar invested would have greatest impact—in IARCs, RARCs, or NARS? In this regard, is AID *over*investing in the IARCs and private sector research organizations and *under*investing in the NARS? If declining ARDN funding for public agricultural research reflects declining AID interest in basic food crops and increasing interest in NTAE crops, should AID seek that the IARCs begin to allocate a larger shared of their AID funding for research on NTAE crops (e.g., fruits and vegetables)?

- What pattern of investment of AID funding in public and private research will have the greatest impact with respect to achieving broad-based economic growth? Would the impact on economic growth of AID's grant funding support for LAC IARCs be increased if the funds were made available to individual Missions to use in supporting host country collaboration with the LAC IARCs or IARCs outside the LAC region? Would such a change, by moving AID's funding support for the IARCs further downstream to support country-specific collaboration between NARS and IARCs, serve to increase the demand for and utilization of IARC technologies and accelerate and increase TG&T's contribution to economic growth?

- Re the referenced "full-time specialist," what would the specialist do and how would he do it? What would be the best qualifications for the specialist? How would the specialist relate to the IARC scientists? What would be the "status" of a specialist in research technical assistance in relation to IARC scientists? Would such a specialist operate more like an extension subject matter specialist who serves area-specific extension agents?

Clearly, the TAC paper focuses on the key problem identified in the present Ag REE Inventory—weakened technology generation and transfer (TG&T) capability of national Ag REE systems in the LAC region. This problem acts as a brake on the speed at which IARCs can generate productivity-increasing technologies and transfer them to farmers.

However, the TAC raises the issue of whether the CGIAR should establish a policy on IARCs playing a strengthening role vis-à-vis national agricultural research systems (e.g., establishing a "research assistance unit" in each IARC). But this solution only makes sense: (a) if IARCs have comparative advantage to take on such an expanded role, and (b) if the magnitude of the problem does not go beyond the resources of the IARCs. Each LAC country already faces uncertainty about which is the best source of technical assistance (e.g. CIMMYT, CIAT, or CIP) in various areas (e.g., farming systems research); no individual center would have a comparative advantage in terms of being *the* source of technical assistance vis-à-vis Ag REE system strengthening. Continuing need for Ag REE strengthening in many LAC (as well as African and Asian) countries suggests that the

problem is of such magnitude that its solution goes beyond the resources of any one IARC, even those of ISNAR.

Obviously, donors such as AID must ensure an appropriate level of investment at *all* levels—IARCs (including ISNAR), regional agricultural research centers (RARCs), and NARS, including the public and private sectors. However, what the TAC does not address is the issue of whether the donors (e.g., AID) that comprise the CGIAR should establish a policy of working together to strengthen NARSs, not because the lack of strong national agricultural research systems is a constraint on the IARCs but rather because a weakened national agricultural research system is a constraint on broad-based economic growth. While the weak TG&T systems in AID-assisted LAC countries can be strengthened on a sustainable basis only by creating a demand in these countries for strengthened Ag REE systems, the solution being considered by the TAC is more supply- than demand-driven.

The LAC Bureau is currently emphasizing an improved macroeconomic and policy environment as the basis for a vigorous private sector response. Such response is a necessary, but not sufficient, condition for achieving the goal of broad-based economic growth in the LAC region. As the macroeconomic and policy environment for investment in agriculture improves, there will be increased demand for productivity-increasing technologies and, thereby, increased demand for adequate TG&T capacity to supply the productivity-increasing technologies needed to respond vigorously to improving market opportunities.

These considerations raise the question of whether AID should begin to exercise a leadership role with respect to making Ag REE-strengthening an integral part of Agency *policy dialogue* with host-country governments, requiring that these governments agree to make a commitment to Ag REE-strengthening (e.g., increased autonomy and adequate budget support for research) as a condition precedent for AID support in various areas including research assistance.

The possibility of such a policy dialogue approach, based on a demand-driven model of agricultural development, should be considered by AID in reaching a decision about the best means of strengthening the ability of national agricultural research systems to interact with the IARCs. Policy dialogue can be advanced by non-project sector assistance (NPSA) programming to encourage host-government policy reforms and improved budget allocations to Ag REE systems, and/or by more traditional projects and programs providing technical support to regional TG&T. However, policy dialogue traditionally has been fueled by some sort of "carrot" such as Economic Support Funds (ESF) and/or PL-480 local currency generations. The following section reviews the current status of PL-480 local currency generations as a source of funds for Ag REE- strengthening in AID-assisted LAC countries.

4. U.S. Government PL-480 Local Currency Generations

A potential funding source for Ag REE in AID-assisted LAC countries is local currency from the sale of PL-480 food commodities. But currently available data on the PL-480 program are not adequate to determine the extent to which LAC Missions, faced by declining ARDN funding for Ag REE during the 1980s, sought or began to use PL-480 local

currency generations as an alternative funding source for Ag REE-strengthening. Table 2.15 indicates that local currency generations under the PL-480 Title I program between 1986 and 1988 increased only in Ecuador. While Title I funding held constant in three countries (Bolivia, Perú, and Jamaica), it fell in Haiti and five Spanish-speaking countries (-3% in El Salvador, -5% in Guatemala, -20% in Honduras, -33% in the Dominican Republic, and -45% in Costa Rica). Thus, if PL-480 Title I funds were used to support Ag REE-strengthening, this only could have occurred in two ways: (1) Missions began to reallocate a larger share of PL-480 Title I funds to support Ag REE activities; or (2) Missions began to allocate available PL-480 Title II local currency generations to Ag REE-strengthening. The latter possibility would make sense in the context of USAID Missions beginning, over time, to place increased emphasis on getting the private sector (PVOs) involved in Ag REE activities.

Data are not available to track how the importing countries allocated funding available under the Title I and II programs, nor are data available on the extent to which the Ag REE components of Mission projects have been or are being funded by PL-480 local currency generations. However, the general provisions of the PL-480 Food for Development Program include "activities of the Government of the importing country designed to develop and extend the technical base for small farmer agriculture...to increase the number of trained farmers and technicians" (U.S. Department of State, 1990: Annex A Food for Development Program). These provisions authorize the use of PL-480 local currency generations to be used in support of TG&T activities carried out by the Ag REE institutions of the importing country.

In Bolivia's case, the FY90 PL-480 program budget provided for up to US$ 20 million for financing lines to provide funds, both through credit and grant mechanisms, for various projects, with several having Ag REE components. One project receiving funding has been the Chapare Regional Development Project (US$ 2 million budgeted for counterpart funds in the project's Associated High Valleys Component). Similarly, the FY90 program budget provides US$ 3 million for the National Wheat Program that includes support for research and extension activities carried out by public and private sector entities (U.S. Dept. of State, 1990: Annex B Program Description). Indeed, a recent USAID/Bolivia reporting cable notes that PL-480 funds:

> were granted to private sector agricultural research and extension stations, performing research in such areas as varietal improvement of potatoes, corn and wheat. They also provide technical assistance and training to farmers. Their services have been quite reliable and are preferred by the vast majority of farmers to the government stations.

The PL-480 program was revised under the "Agricultural Development and Trade Act of 1990." These revisions have implications in terms of accessibility of AID-assisted LAC countries to local currency generations that potentially could be used for Ag REE-strengthening. The revised program has provisions for Title I and Title III, as follows:

> Title I, a loan-financed concessional sales program to be administered by USDA, allows local currency payments to be used, among other objectives, for establishment

and expansion of institutions for basic and applied agricultural research and the use of such research through development of extension services; and for research in agriculture, forestry, and aquaculture, including collaborative research which is mutually beneficial to the U.S. and the recipient country. Further, the Secretary of Agriculture is authorized to establish a program of grant assistance to U.S. and foreign non-governmental organizations for the purposes of buying discounted external debt of foreign governments to obtain local currencies needed to finance projects "involving the research, study, prevention, or control of animal and plant pests and diseases."

Title III, a bilateral grant program to be administered by USAID, allows local currency proceeds of sales to be used, among other objectives, for research on malnutrition and its causes and for support for research (including collaborative research which is mutually beneficial to the U.S. and the recipient country), education, and extension activities in agricultural sciences.

Section 413 provides that:

> To the extent practicable, assistance for a foreign country under this Act shall be coordinated and integrated with United States development assistance objectives and programs for that country, and with the overall development strategy of that country. Special emphasis should be placed on, and funds devoted to, activities that will increase the nutritional impact of programs of assistance under this Act, and child-survival programs and projects, in least developed countries, by improving the design and implementation of such programs and projects" (as cited in 1/14/91 memorandum from Don Ferguson, USDA/OICD/DRD, on "Authorized Uses of United States Owned Foreign Currencies: Sections 104 and 305 and Related Provisions").

To be eligible for the Title III program, an LAC country must be a "least developed country," i.e., a country must meet the criteria for its inclusion in the World Bank's Civil Works Preference list, *or* the country must be a "food deficit" country. To be a "food deficit" country, AID's administrator must determine that the daily per capita caloric consumption in the country is less than 2300 calories, that the country cannot meet its food needs through domestic production or imports due to a shortage of foreign exchange earnings, *and* that the child mortality rate under age 5 is greater than 100 per 1,000 births.

The Conference Committee Report states that "because calorie and child mortality data may be inaccurate, out of date, or unavailable, the administrator may be required to use his judgement and the judgement of experts in determining that a country meets the criteria." Also, Title III provides that priority shall be given to countries that have demonstrated the greatest need for food, the capacity to use food assistance effectively, and a commitment to policies that promote food security, and that have a long-term plan for development. On the basis of these criteria and available data (Table 2.16), only four AID-assisted LAC countries (Haiti, Bolivia, Honduras, and Perú) are eligible to participate in Title III (bilateral grant).

Table 2.15. U.S. Government PL-480 Title I Local Currency Generations in LAC AID-Assisted Countries (FY86-FY90).

LAC SUBREGIONS	FY86	FY87	FY88	Thru July FY89	Thru Sept FY90	Percent Increase 86 to 88
	U.S.$'000					
ANDEAN REGION						
Bolivia	20000	20000	20000	22000	20000	0
Ecuador a)	5000	1591	11612	3300	5610	132
Perú	20000	20000	20000	21000	20000	0
CARIBBEAN REGION						
Dominican Republic	30000	30000	20000	20000	14600	-33.3
Haiti b)	15000	10000	0	0	4000	-
Jamaica	35000	37800	35000	40000	40000	0
RDO/C (E. Caribbean)	0	0	0	0	0	0
CENTRAL AMERICA						
Belize		0	0	0		0
Costa Rica	20000	16000	11000	15000	15000	-45.0
El Salvador	44000	30400	42600	40000	40200	-3.2
Guatemala	19000	21500	18000	18000	18000	-5.3
Honduras	15000	12000	12000	18000	12000	-20.0

a) Beginning in 1987, funding for Ecuador is Sec. 416 funding.
b) Beginning in 1990, funding for Haiti is Title II Government to Government.

Source: Food for Peace Summary, Latin America & Caribbean Year End Totals Title I, II, III, 416 (1986-1990). Office of Food for Peace, Bureau for Food for Peace and Voluntary Assistance, United States Agency for International Development.

Table 2.16. Food Insecure Countries (Source: USAID/FVA).

KEY:

*** = Countries receiving IBRD Civil Works Preferences
** = Countries with average daily calorie supply less than 2,300
* = Countries with child (under five) mortality rate greater than 100 per 1,000.

***	**	*	AID-Assisted LAC Country	GNP/Capita 1989	FAO Avg. Daily Calorie Supply 1988	UNICEF Under 5 Mortality Rate 1988
***	**	*	Haiti	400	1911	171
	**	*	Bolivia	600	2086	172
	**	*	Honduras	900	2164	107
	**	*	Perú	1090	2269	123
			Nicaragua	-	2361	95
			Dom. Rep.	790	2357	81
			Guatemala	920	2352	99
			Ecuador	1040	2388	87
			El Salvador	1040	2415	84
			Jamaica	1260	2572	22
			Panamá	1780	2468	34
			Costa Rica	1790	2782	22

CHAPTER III
STRATEGY TRENDS FOR AG REE IN LAC USAID MISSION PORTFOLIOS

This chapter identifies key trends in AID support for Ag REE-strengthening in the LAC region. It first presents an historical overview of AID-funded Ag REE-strengthening efforts since the 1950s, and then reviews programs during the 1980s, identifying the extent to which Agency-funded projects have assisted in developing the technology generation and transfer (TG&T) capability of Ag REE systems. Finally, the chapter identifies key trends in the evolution of AID strategy and project approaches to Ag REE-strengthening.

A. Historical Overview

AID[1] has funded Ag REE projects or projects with Ag REE components in the LAC region for over 40 years.[2] Jim Chapman (personal communication) identifies three major phases:

- 1950-70 Assistance to Ministries of Agriculture in the areas of agricultural extension and/or research
- 1970-85 Creation of semiautonomous agricultural research and/or extension institutes (ICTA, CENTA, IDIAP, INIAP, INIPA, IBTA, etc.)
- 1985- Creation and development of autonomous private sector foundations which conduct or contract out research and extension (FHIA, FUNDAGRO, etc.)

The pattern of creating semiautonomous research institutions was evident even earlier than the 1970s. As Valverde (1990:25) notes: "The reorganization of research and the adoption of decentralized institutes as structural models was the generalized patterns in the 1960s." Table 3.1 lists the national agricultural research institutes that have been created since 1957 in the LAC region. A visual outline of the evolution of agricultural research and extension models, from "ministry model" to "semiautonomous model" to "fully autonomous model," is given in Figure 3.1.

[1]AID is also understood here in the generic sense of including the Agency's predecessor agencies.

[2]As Valverde (1990) notes, during the decades of the 1960s and 1970s, technical and financial assistance to national agricultural research systems (NARS) also was provided by the Ford and Rockefeller Foundations, United Nations special funds, resources from the Inter-American Development Bank, agencies for cooperation (FAO, CEPAL, ECLA, IICA), and bilateral aid from Canada, Great Britain, Sweden, Switzerland, and Germany.

Table 3.1. National Research Institutes Created Since 1957 in Latin America.
(AA = Administrative Autonomy: A = Autonomous; S = Semiautonomous)

REGION/ Country	Acronym	Name and Year	AA
ANDEAN			
Bolivia	IBTA	Instituto Boliviano de Tecnología Agropecuaria (1975)	S
Ecuador	INIAP	Instituto Nacional de Investigación Agropecuaria (1959)	S
Perú	INIPA	Instituto Nacional de Investigación y Promoción Agraria (1981)	S
	INIAA	Instituto Nacional de Investigación Agropecuaria y Agroindustrial (1987)	S
CARIBBEAN			
Dom. Rep.	IDIAA[3]	Instituto Dominicano de Investigación Agropecuaria	-
Jamaica	NARIJ[4]	National Agricultural Research Institute of Jamaica	-
CENTRAL AMERICA			
Guatemala	ICTA	Instituto de Ciencia y Tecnología Agricolas	S
Nicaragua	INTA[5]	Instituto Nacional de Tecnología Agropecuaria	-
Panamá	IDIAP	Instituto Nacional de Investigación Agropecuaria de Panamá (1975)	S

[3]Not implemented.

[4]In the process of being implemented.

[5]Research activities were initiated in 1979 by the administrative systems of the Ministry of Agriculture.

Table 3.1 (continued)

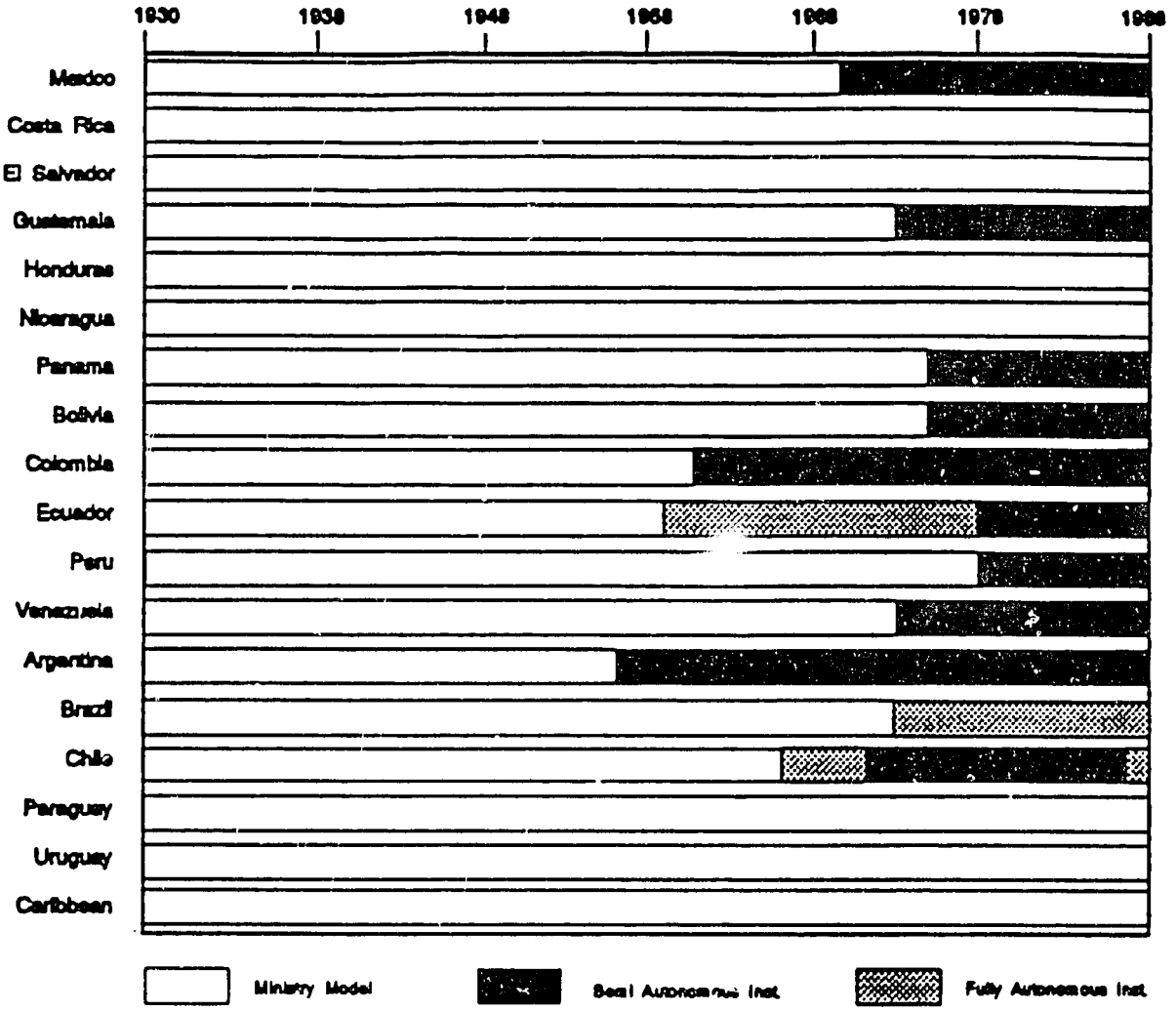
REGION/ Country	Acronym	Name and Year	AA
OTHER[6]			
Argentina	INTA	Instituto Nacional de Tecnología Agropecuaria (1957)	S
Mexico	INIA	Instituto Nacional de Investigación Agropecuaria (1961)	S
Uruguay	CIAAB	Centro de Investigaciones Agrícolas "Alberto Boerger" (1961)	A
Colombia	ICA	Instituto Colombiano Agropecuario (1962)	S
Chile	INIA	Instituto Nacional de Investigación Agropecuaria (1964)	A
Brazil	EMBRAPA	Empresa Brasileira de Pesquisa Agropecuaria (1973)	A
Venezuela	FONAIAP	Fondo Nacional de Asistencia y Investigación Agropecuaria (1973)	S
Venezuela	INIA	Instituto Nacional de Investigación Agraria (1978)	S
Mexico	INIFAP	Instituto Nacional de Investigaciones Forestales y Agropecuaria (1986)	S
Uruguay	INIA[7]	Instituto Nacional de Investigación Agropecuaria (1989)	A
Guyana	NARIG	National Agricultural Research Institute of Guyana	S

[6]LAC countries that do not currently have USAID Missions.

[7]The law creating INIA is under discussion in the Uruguayan Congress.

Source: Valverde (1990:26).

Figure 3.1. Historical Evolution of Agricultural Research and Extension Organizational Models in the LAC Region (Source: Valverde, 1990:27).



Looking back across these developments over the past 40 years, Chapman asks:

Is there no common denominator among them which would appropriately characterize the evolution of REE systems in [the] LAC [region]?... It would be interesting to know why these changes or shifts...took place, what were [the] strengths and weaknesses of each type of institutional form, what are the lessons to be extracted from all of this and what are the implications for future efforts in REE?

The very existence of the "changes or shifts" identified by Chapman suggests that AID assistance for Ag REE-strengthening in the LAC region also has undergone a dramatic shift during the past four decades. From the mid-1950s to the mid-1970s, the focus of AID project assistance was on institution building in agricultural universities or ministries of agriculture, with the objective of transferring the U.S. Land Grant model of university research, extension, and education (see Box 3.1). This was a major thrust of AID's program during the mid-1950s in Colombia, where Michigan State University assisted Colombia's National University in developing agronomy departments at Palmira, Medellín, and Bogotá. Table 3.2 lists other AID-funded agricultural university institution building programs in the LAC region.

Box 3.1. Experience of the U.S. Land Grant Model in the LAC Region (Vessuri, 1990:1547-1548, 1551).

"...a peculiar organizational R&D pattern, based on the land grant colleges and the experimental station system of the United States, was implanted throughout Latin America in the mid-1950s and early 1960s. Examples of this included the National Institute of Farming Technology (INTA) in Argentina (1957), the National Institute of Agricultural Research (INIAP) in Ecuador (1959), the National Agricultural and Livestock Research Fund (FONAIAP) in Venezuela (1959), the National Institute of Agricultural Research (INIA) in Mexico (1960), the Agricultural Research and Promotion Service (SIPA) in Perú (1960), the Colombian Agricultural and Livestock Institute (ICA) (1963), and the National Institute of Agricultural Research (INIA) in Chile (1964). Their mission involved improving the diffusion of technology already available in the industrialized countries. Consequently, the industrialized countries' priorities for technological development were also adopted, within limits imposed by resource availability. In general, the resulting technology has been capital-intensive and has centered on products of temperate climates, forms of production appropriate to the natural resources of the developed countries, and crops with good prospects in the export markets, such as corn..., sugar..., milk, beef..., and rice.... These institutes have tended to disregard the development of capabilities to make fuller use of native productive potential....

[But] "the institutes lost efficiency, among other things, because of their broad range of activities resulting from the tremendous heterogeneity of agricultural production in Latin America. The North American 'federal' scheme they copied was a response to high regional heterogeneity of the U.S. agricultural sector, in the context of a relatively homogeneous production structure that facilitated the linkage to the different farming interest groups. On the contrary, the single-agency model adopted in Latin America tended to hinder such a relationship and the ability to respond to the needs of many different groups, frequently with conflicting interests."

Table 3.2. AID-Funded Agricultural University Institution Building Programs in the LAC Region (Hansen, 1989).

Year	Country	Assisted University	Assisting University
51-57	Panamá[8]	National Institute of Agriculture	University of Arkansas
54-57	Chile	University of Concepción	University of California
54-57	Ecuador	University of Quito and Guayaquil	University of Idaho
54-56	Mexico	Superior Institute of Agriculture	Texas A&M University
54-68 82-88	Perú	National Agrarian University	North Carolina St. University
57-63	Guatemala	University of San Carlos	University of Kentucky
60-63 64-67	Paraguay	National University of Asunción	Montana State University Washington State University
62-68	Uruguay	Universidad de la República	Iowa State University
64-73	Brazil	University of Ceará	University of Arizona
64-73	Brazil	University of Sao Paulo	Ohio State University
64-73	Brazil	University of Rio Grande do Sul	University of Wisconsin
64-73	Brazil	University of Vicosa	Purdue University
65-70	Costa Rica	University of Costa Rica	University of Florida
65-73	Dominican Rep.	Superior Institute of Agriculture	Texas A&M University.
86-88	Costa Rica	EARTH (Agricultural School for the Rural Humid Tropics)	California Poly. State University, Rutgers University, University of Nebraska, Virginia Polytechnic University

[8]Rutgers University provided TA to IDIAP in Panamá during the mid-1980s.

But transferring the Land Grant university model to LAC countries proved very difficult, if not impossible, given that the functions of research, extension, and education were most always housed in separate organizations, with most countries lacking any mechanism to integrate and coordinate these functions. The result of the lack of any single institution for carrying out the functions of agricultural research, extension, and education in an integrated manner was a tendency to address these functions individually through separate projects. Again, drawing on Colombia as an example, AID started two extension projects in the mid-1950s:[9]

- In 1955, in the Department of Boyacá, a pilot extension program [Servicio Técnico Agrícola Colombiano Americano (STACA)], modeled on the classical U.S. extension program, was started; and

- In 1957, following establishment of the Cauca Valley Corporation (CVC), modeled on the U.S. Tennessee Valley Authority (TVA), an extension program, modeled on the Boyacá STACA program, was started.

Initiation of these extension projects by USAID/Colombia was influenced by two factors. First, a functioning agricultural research program [Departamento de Investigación Agrícola (DIA)] had already been started in the Ministry of Agriculture by the Rockefeller Foundation.[10] But DIA had neither the mandate nor the resources to carry out technology transfer; hence the need to create an extension capability. Second, while the university's agronomy departments potentially could do extension, the university was an autonomous institution that had neither mandate nor incentive to carry out agricultural research or extension. Thus, the situation dictated that a structure to carry out extension could only be established outside the existing research (DIA) and educational (National University) institutions.

In 1957 the Government of Colombia established the Colombian Agricultural Institute (ICA), with a mandate to carry out agricultural research and extension. While the Rockefeller Foundation continued to provide technical assistance support to ICA through much of the 1960s, by 1968 the foundation began to reallocate its Colombian program field staff to the newly created International Center for Tropical Agriculture (CIAT) in Palmira, Colombia. But this did not create a severe technical assistance vacuum because by 1966 USAID/Colombia, with technical assistance from the University of Nebraska, had undertaken a major project to develop ICA's agricultural research and extension capability.

Thus, within a matter of only a decade or so (from the mid-1950s to the mid-1960s), USAID/Colombia supported a series of agricultural institution building projects—first in education, then in extension, and finally in research. The pattern that has been illustrated here for Colombia, of addressing the separate functions of research, extension, and education

[9]Much of the following history relating to USAID experience in Colombia is drawn from conversations with Albert (Scaff) Brown and Francis C. Byrnes.

[10]This program was modeled on the success of the Rockefeller Foundation agricultural research program in Mexico.

through a series of separate projects, has been repeated over time in other AID-assisted countries in the LAC region, although not necessarily in the same sequence.

But there was a recognition in each case that increasing agricultural productivity depends on improving agricultural technology, while improving technology depends on research to generate technology, extension to transfer the technology to farmers, and education to develop the human resources to carry out research and extension. Thus, AID's agricultural institution building projects during this period sought to provide the missing ingredient, whether it be research, extension, education, or a combination of these. Indeed, where technical assistance staff of a U.S. Land Grant university were involved, they invariably sought to duplicate the Land Grant model of research, extension, and education within the specific institution being assisted.

Following the creation of the International Agricultural Research Centers (IARCs) in the early 1960s (e.g., the International Rice Research Institute), the early success of some IARCs in developing productivity-increasing agricultural technology (e.g., "miracle" IR-8 rice), and growing perceptions that agricultural extension in the LAC region had nothing to offer, or that what it had to offer was not what farmers needed, there was increasing recognition of the need to direct greater attention to agricultural research. But there also was growing frustration that public sector agricultural research organizations, plagued by political interference and low salary levels, could not provide the kind of environment essential for a productive agricultural technology generation system. These factors led many AID-assisted LAC countries between the late 1960s and early 1980s to create semiautonomous agricultural research and/or extension institutes (e.g., ICTA in Guatemala).

Thus, the perception that extension would be severely limited without being able to offer farmers productivity-increasing agricultural technologies led AID-funded project assistance over time to increased emphasis on agricultural research. The emphasis on research tended to focus on how to increase or boost commodity productivity. Research capacity building during this period focused on establishing research experiment stations, with the emphasis being on strengthening the capacity of agricultural research system to carry out production research. However, over time there was increasing realization that farmers would not adopt new agricultural technologies unless the technologies were adapted to the more site-specific circumstances characterizing farmers' fields.

A new orientation emerged between the mid-1970s to the mid-1980s, as agricultural researchers began to move off the experiment stations and into farmers' fields. The success of Mexico's Puebla Project in boosting corn yields through on-farm adaptive research was an important step in the development of the farming systems approach to agricultural research. During this period, several LAC AID Missions initiated farming systems research and extension (FSR/E) projects or projects having FSR/E components.[11] Yet FSR/E projects

[11]Byrnes (1990a) reviews three AID-funded FSR/E projects implemented in the LAC region between 1975 and 1987: Guatemala Food Productivity and Nutritional Improvement (520-0232) (Byrnes, 1989b); Honduras Agricultural Research (520-0139) (Byrnes 1989c); and ROCAP Small Farm Production Systems (596-0083) (Byrnes, 1989d). Other FSR/E projects implemented in the LAC region are identified in Byrnes (1989a).

often did not live up to expectations because they could not overcome long-standing constraints to linking the Ag REE functions (Byrnes, 1990a).

During this period AID increasingly became frustrated with the lackluster performance of public agricultural research and extension organizations. In case after case, host country governments failed to provide adequate counterpart support to meet the recurrent costs of whatever technology generation and transfer (TG&T) model AID technical assistance projects sought to implement. For example, in 1986, despite an evaluation team's recommendations and totally frustrated by a lack of Ministry of Agriculture support, USAID/ Panamá sought to cancel the Agricultural Technology Development and Agricultural Technology Transfer projects (Byrnes, et al., 1987).

The increasing frustration felt by AID with trying to implement agricultural TG&T through public sector research and extension organizations had two main results:

- AID bilateral support for national-level, public sector agricultural research began to decline; indeed, there have been no new bilateral USAID programs for direct strengthening of public sector agricultural research in the LAC region in over five years.

- AID support for public agricultural research in the LAC region increasingly is being limited to funding the region's International Agricultural Research Centers (IARCs) and two regional centers (RARCs)—the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) in Costa Rica, which provides assistance to Central America; and the Caribbean Agricultural Research and Development Institute (CARDI), in Trinidad, which primarily serves the countries comprising the Organization of Eastern Caribbean States (OECS). The three LAC IARCs are: International Center for Tropical Agriculture (CIAT), Colombia; International Maize and Wheat Improvement Center (CIMMYT), México; and the International Potato Center (CIP), Perú.

Further, by 1985, AID was under pressure to find ways to cut development assistance budgets and to increase the private sector's role in development. Increasingly, from one country to the next, USAID Missions, frustrated with a perceived lack of progress in supporting public sector agricultural research and extension organizations, began to search for ways to "privatize" agricultural TG&T, especially for nontraditional agricultural export (NTAE) crops that could provide these countries with an improved ability to earn foreign exchange desperately needed to repay bank loans.

Indeed, in a period of less than five years, between 1984 and 1989, USAID Missions created and funded private agricultural research organizations in five countries, including Honduras, Jamaica, the Dominican Republic, Perú, and Ecuador, with similar organizations also being considered for Guatemala and El Salvador (Sarles, 1990). Underlying AID's push

for privatization of agricultural research in the LAC region has been the assumption (yet to be proven) that privatization (somehow) can overcome a series of constraints that have impeded institutionalization of effective agricultural research capacity in public sector organizations. These constraints, all conditioned by factors external to the research organization, are (Sarles, 1987:6-7; 1989):

- **Stability and Level of Funding:** Lack of control of the research budget, with the available funding consistently low and its availability in terms of timing controlled not by the Ministry of Agriculture but by the Ministry of Finance;

- **Constituency Support/Relevance of Research:** A political, rather than scientific or economic orientation towards setting the research agenda, filling important positions, and coordinating with extension, with the average Research Institute Director's tenure being short;

- **Professionalism:** With personnel systems often tied to the government's civil service system regulations, low salaries and a lack of incentives result in a failure to attract and retain qualified research managers and researchers, with the result that priorities often are not established or are not enforced; and

- **Coordination with Other Key Institutions:** Lack of integration between public and private sector research, and among research, education, and extension.

The first of these, stability and level of funding, while clearly interrelated to the other constraints, has proven to be the most problematic constraint. Indeed, the LAC Missions currently supporting private agricultural research organizations are now searching for strategies and mechanisms to ensure financial sustainability of these research organizations. One strategy being explored by several Missions is that of establishing an endowment sufficiently large to generate a dividend stream to meet the expenses of a private research organization (Hansen, 1990). Typically, the AID-funded private research organizations are mandated to carry out agricultural research on the nontraditional agricultural export (NTAE) crops.

Yet the need for improved TG&T capacity for traditional food crops has not, over the past few decades, become any less urgent, as government research and extension programs in most AID-assisted LAC countries did little to stem growth in cereal imports (Figure 1.2) or decline in per capita food production (Figure 1.3). Indeed, as host-country government funding for Ag REE fell dramatically during the past decade in many of these countries (Table 1.2), AID funding for Ag REE during this same period also fell (see Chapter II). Further, as scarce resources were being redirected to support the development of private sector research on the NTAE crops, there was a failure to realize the negative consequences for TG&T for the basic food crops (see Box 3.2).

Box 3.2. Consequences of Privatization of Agricultural Research in the LAC Region (from Vessuri, 1990:1548).

"The new private organizations focus their attention on technologies, that, by their very nature, allow for the private appropriation of profits. Their activities cannot thus be expected to cover the development of technological potential in the broadest sense, that is, including education, training, etc.; without these functions, however, the ability of the rest of the system to develop new technologies would quickly be exhausted. Likewise, private organizations will not assume specific activities of a generic nature or with a low probability of bringing about immediate results. Finally, the new private organizations are not interested in developing certain agronomic techniques (cropping practices, pasture management, etc.) because of the difficulty of privately appropriating their benefits. This means that a broad range of users neglected by the new institutional formats can be served only by public organizations...."

We are now at the outset of a fifth decade (the 1990s) of AID development assistance, during which AID's traditional "war on hunger" portfolio of projects already is under pressure, at least for the Andean countries, to become a portfolio of "war on drugs" projects. AID's attention and resources increasingly are being diverted from a traditional role of raising crop productivity (the "corn booster" role) toward a new role, namely, that of "coca buster." As part of this new role, AID projects in Perú and Bolivia are encouraging Andean peasants to grow crops other than coca and discouraging drug consumption in the population at large.[12] Indeed, about 43% ($125,000,000) of AID's LAC ARDN for FY91 portfolio is targeted for "Narcotic Awareness."

USAID/Bolivia is now designing the "Alternative Development Project" to follow the "Chapare Regional Development Project." Yet, while the Mission is required by the U.S. Congress to spend millions of dollars to discourage Bolivian peasants from migrating to the Chapare to grow coca, there are indications that the Mission is beginning to realize that developing alternative technologies, be these for NTAE crops or traditional food crops, cannot proceed if the required markets for alternative crops, as well as the required TG&T capability in Ag REE institutions, public or private, is weak or absent (Byrnes, 1990b, 1991).

The limited TG&T capability available to support a "Chapare Regional Development Project" provides a dramatic example of a more general problem facing the LAC region, namely, that of the continuing constraint on agricultural TG&T caused by a failure of national governments to allocate the autonomy and resources that are required to develop and sustain Ag REE systems that can carry out TG&T efficiently. Indeed, the autonomous or semiautonomous structure of most national agricultural research systems (NARS) in the LAC region is called into question in a recent analysis of "the Latin American Model" of

[12] A World Bank official reported at a recent meeting of the Inter-American Council that the price of coca leaves is such a small portion of the price of coca that processors can increase what they pay farmers enough to keep coca more profitable than any other crop. Others maintain that Bolivian farmers do not like a market that is unstable, which prevails when there is effective interdiction against coca trading, and would prefer to grow and sell crops that have long-run market sustainability.

decentralized public institutions (Valverde, 1990:25-31). Box 3.3 abstracts key points from Valverde's analysis.

Box 3.3. The Latin American Model of Decentralized Public Sector Agricultural Research (from Valverde, 1990:27, 29-30).

"Beginning with the premise that total autonomy is nonexistent within a public or semipublic system, it could be said that, functionally, a decentralized public institution is autonomous insofar as it has the authority to organize, plan, budget, and execute the research activities delegated to it. ...it is autonomous in terms of its direction, administration, management, and operation, always taking into account that these activities are in keeping with the socioeconomic development policies of the country and agricultural sector.

"In the...LAC region, the degree and type of decentralization of central government research activities ranges from decentralized autonomous bodies (EMBRAPA-Brazil and INIA-Chile), to decentralized bodies strongly tied to the central and bureaucratic semiautonomous systems of the state (INIAP, IBTA...). Between these two extremes lie different degrees of dependence on the central government. Regrettably, no clear and convincing indicators have been developed to distinguish an autonomous decentralized institution from a semiautonomous one. Thus, a decentralized institution is not necessarily autonomous in terms of its administration, management, and operation.

"...most decentralized bodies in LAC are in one way or another compulsorily subordinate to or linked to the ministry (agrarian sector) in all that refers to the strategies, policies, and priorities established by the minister of the sector and to the coordination of the programming, budgeting, execution, and evaluation of the results.

"In practice, however, coordination in extreme cases has been converted by the ministry into an excess of control measures, resulting in the disappearance of the operative and administrative flexibility of the decentralized institute. Consequently, the administrative status of the decentralized body does not differ in any way from that of any other department acting within the norms governing the ministry or public departments of the central government.

"To be more precise, anything in the [LAC] NARs concerning the structure, organization, and management of financial and human resources generally operates entirely within the norms of the ministries of agriculture and finance as well as the national regulations on personnel management. ... These norms and regulations are suited to routine office work, but they are not flexible enough to accommodate exceptional situations such as those involved in agricultural research activities.

"Research by nature deals with biological entities and complex ecological systems. It needs constant personal attention and a flow of physical resources, specific and not always predictable research materials, and a time schedule not always subject to rigid fiscal calendars. For example, laboratory and field experiments need constant attention which does not fit into the strict routine established for professionals and technicians working within the central bureaucratic system. (continued...)

Box 3.3. The Latin American Model of Decentralized Public Sector Agricultural Research (continued from Valverde, 1990:27, 29-30).

"Without going into budgetary details, it may be said that, under the central government system of budgetary allocation and payment of most LAC countries, the activities related to research involving biological entities and dynamic ecological systems are [not] compatible with budgetary execution. The common problem encountered is that neither the allocation of resources nor the calendar of payments conforms to the needs of the research calendar.

"In other words, the element of administrative flexibility is absent or limited with regard to the operation and allocation of the physical, financial, and human resources necessary to execute the research activities. . . . It would seem that a feasible alternative would be to grant real autonomy to the decentralized institutes in terms of a series of exceptions to the laws, which, without surpassing any legal framework, would permit them to implement measures to increase their level of flexibility, efficiency, and effectiveness in the management of available resources. It would also allow them to attract and manage additional resources.

"Autonomy, therefore, appears to be a precondition to taking the measures needed to allow the implantation of salary structures—*escalafones*—and fiscal systems according to the research activity. These are the basic elements needed to end the decline and continuous drain of talent that is becoming more and more acute within the research system."0

Valverde goes on to identify the functional and/or activity areas where administrative flexibility and autonomy are needed in a NARS. These areas are as follows:

- Generation and management of income
- Establishment and maintenance of a researcher wage scale
- Decisions about international technical cooperation
- Flexibility for travel abroad
- Hiring consultants
- Flexible budgetary execution
- Management of donor resources
- Flexibility in making contracts and procuring goods

The end result of a lack of administrative flexibility and autonomy in LAC public Ag REE systems (or NARS), combined with the decline in host country public (see Chapter I.C.3) and AID (see Chapter II) funding for Ag REE has been decline in the TG&T capacity of Ag REE systems in AID-assisted LAC countries (see Box 3.4).

Box 3.4. An Observer's View of R&D Capability in the LAC Region (Vessuri, 1990:1543, 1550).

"Observers of the [LAC] region expect that in the coming years science and technology capability will undergo a process of accelerated obsolescence, and will, therefore, become increasingly out of step with the social and material needs of the population....

"...Latin American R&D systems have not kept pace with international developments and continue to be deficient. There is research capability, but it excels only in more or less isolated enclaves. Conditions are such that in more than a few cases, the very weight of the often low-quality, obsolete, and bureaucratized institutional research infrastructure acts as a powerful obstacle to change. Latin American universities are mostly politicized and controlled by self-serving interest groups. National research systems are handicapped in their ability to create the scientific and technical profiles required by the production systems undergoing deep transformation during the current technological revolution in the industrialized countries. Probably no single country in the region is able to face by itself the technological challenge of the coming decades.

"Most recent studies point to a serious deterioration of working conditions in the research field and the growing alienation of researchers, who lack stimuli and often the minimal conditions to pursue their work."

While the "low-quality, obsolete and bureaucratized institutional research infrastructure" often may act as "a powerful obstacle to change," it does not follow that this should be an excuse for the development assistance community to allow national governments to continue to fail to allocate the autonomy and resources that are required to develop and sustain Ag REE systems that can carry out TG&T efficiently. Yet in AID there is no evident consensus on whether the apparent AID strategy (neglect of the public Ag REE system in favor of developing private Ag REE systems) should continue. In the absence of any consensus to address these problems, the present strategy has been based on "rolling redesign" that responds not to the basic problems faced by LAC Ag REE systems but rather to whatever may be the latest development panacea.[13] Yet an unanswered question remains in terms of what role, if any, AID should play in assisting LAC countries with strengthening their Ag REE systems, whether public or private, and whether designed to support TG&T for traditional food crops, NTAE crops, or a mix of commodities including traditional export crops, livestock, fisheries and aquaculture, and forestry.

As AID has increased its support for agricultural research on NTAE crops by private sector organizations and reduced its support for public sector research on traditional food crops for domestic consumption, the Agency has skirted three issues:

1. Is there is a continuing need for public involvement in agricultural research in AID-assisted LAC countries?

[13]Over the past decade, the focus has shifted from one area to another, including institution building, FSR/E, coca substitution, policy dialogue, privatization, structural adjustment, sustainability, and so on.

2. If there is a continuing need for public involvement in agricultural research in AID-assisted LAC countries, is there an optimal role or scale of public involvement in agricultural research that varies, from one country to the next, as a function of each country's resource endowments (e.g., size of country)?

3. If each AID-assisted LAC country has a continuing need for public involvement in agricultural research, and if the optimal scale of this involvement varies as a function of each country's resource endowments, what criteria can be used to decide what kind of public sector agricultural research capacity building is most appropriate in each country situation?

Clearly, in retrospect, small and/or resource-poor countries (e.g., Haiti) cannot afford the same full-scale NARS of the type that can be afforded by larger countries with more resources (e.g, EMBRAPA in Brazil, ICA in Colombia, or INIA in Mexico). But small and/or resource-poor countries do need to have some minimum capacity to reach out to external technology sources (e.g., IARCs) and bring productivity-increasing technologies to their countries for "downstream" or adaptive research. On the other hand, the larger and/or resource-richer countries (e.g., Ecuador) have the potential to develop "upstream" research capacity to carry out more applied or basic research geared to these countries' agricultural potential.

While the overall strategy of donors (e.g., Rockefeller and Ford Foundations) was to reduce funding to national programs and to create and increase funding for International Agricultural Research Centers (IARCs), AID's *de facto* "strategy" in the LAC region has been to reduce funding for public agricultural research programs and to create and increase funding for private agricultural research organizations. While the strategy of other donors was reinforced by the creation of the Consultative Group for International Agricultural Research (CGIAR) to marshal and coordinate donor funding for research on basic food crops, no comparable group was created to marshal and coordinate funding for the various private agricultural research organizations created by AID in the LAC region. Yet, while the donor community has continued to focus primarily on basic food crops, AID redirected its attention from a primary focus on research on traditional food crops for domestic consumption to research on foreign exchange-earning NTAE crops. In the long run, there is uncertainty about whether this approach will contribute to or be counterproductive to AID's stated development goal, namely, "to increase the income of the poor majority and expand the availability and consumption of food, while maintaining and enhancing the natural resource base."

B. Strengthening TG&T Capability of Ag REE Institutions

With this overview in mind, the discussion turns to a review of AID support for Ag REE-strengthening in the LAC region during the 1980s. Ag REE's current status in the region (reviewed in Chapter IV), is not a simple function of AID's activities in the region during the 1980s. The current situation grew out of nearly 40 years of development assistance implemented in a complex of environmental constraints (political, economic, social, cultural, biophysical, and agro-climatic). Keeping this in mind, this section analyzes the most recent decade of AID support for Ag REE-strengthening in the LAC region. When

the decade of the 1980s is seen in the light of this overview, one can identify the variables that have defined the course of evolution of AID strategy and project approaches to strengthening the TG&T capability of Ag REE systems in the LAC region. These variables are defined following this section's country-specific analysis which is based on a much more detailed analysis in Annexes A and B.

1. Andean Region

a. Bolivia

USAID/Bolivia placed little emphasis during the 1980s on Ag REE-strengthening. The Mission's portfolio was driven by two objectives: (1) to find alternative crops and technologies to substitute for coca; and (2) to reactivate the private agricultural sector by strengthening and expanding the capacity of private agricultural producer organizations (PAOs) to provide their members private-sector services (e.g., seed, credit, technical assistance, machinery, storage, transport, and marketing).

Yet a recent training needs assessment of USAID/Bolivia's Chapare Regional Development project identified the need to strengthen public and private sector capability to carry out adaptive on-farm research as essential if the project is to be successful in developing crop alternatives to producing coca (Byrnes, 1990b). In both of the project's target regions (Chapare and Associated High Valleys), the Mission's strategy depends heavily on agricultural TG&T as a key to achieving the project's mandate to provide crops and technologies that [illegible] be remunerative alternatives to coca production. Yet none of the Mission's projects [illegible] the 1980s, except Chapare, focused on strengthening the capability of public or private organizations to carry out agricultural TG&T.

The Mission's Private Agricultural Producer Organizations (PAO) project has had some success in strengthening PAO capability to provide member services. But the project's emphasis on private-sector services neglects that farmer demand for services depends to a significant extent on farmer demand for and the available supply of agricultural technology. While the 4/90 evaluation of the project found one PAO that was providing, via a check-off system, funding for agricultural research, this PAO was reaching only a relatively elite group of farmers in the Santa Cruz region; otherwise, none of the PAO project's inputs is directed at strengthening private or public capacity to generate technologies that farmers will demand.

While USAID/Bolivia's portfolio in recent years has lacked a long-term program or series of projects to strengthen public or private agricultural TG&T capability, the success of the Mission's current coca substitution initiative ultimately will depend, to a large extent, on Bolivia's agricultural TG&T capability. In this regard, a study conducted by the International Service for National Agricultural Research (ISNAR, 1989a) identified the need to rebuild Bolivia's agricultural TG&T system. The study found that IBTA's resources have deteriorated because of a loss of qualified staff, degradation of priority-setting and programming systems, and incapability of extension to attend efficiently to the needs of the rural population.

The study proposed restructuring IBTA by creating "regional services for research and transfer of agricultural technology." While the regional services initially would be funded by the GOB and departments, there would be a strategy to develop the system gradually, whereby the regional services would receive increasing local support from development corporations, regional agricultural chambers, etc. Once local support provided a majority of the funding for the regional services, they would become autonomous entities, adopting a status similar to that actually held in the Department of Santa Cruz by the Research Center for Tropical Agriculture (CIAT/Bolivia). The study recommended a phased action plan to implement the system, and identified a global project that donors could support to provide the components needed for institutional strengthening. Such a global project or program could include the following projects or subprojects:

- Strengthening the central unit of a national agricultural research and technology transfer system;
- Strengthening and consolidating national agricultural research and technology transfer programs;
- Establishing or consolidating technological linkage units; and
- Supporting the regional services of the agricultural research and technology transfer system.

While the study's proposed action plan for implementing the agricultural research and technology transfer system recognizes the need to train the personnel required to operate the system, neither the study nor the action plan identified the problems or needs of Bolivia's agricultural education system. A subsequent study by the World Bank recommended that, rather than attempting to restructure IBTA nationwide, the Bank should assist Bolivia in implementing a more limited restructuring, with an emphasis on providing support for revitalizing IBTA in defined target regions offering the greatest potential for agricultural growth.

b. Ecuador

USAID/Ecuador sought in the early 1980s to strengthen public Ag REE systems. The Integrated Rural Development (IRD) project sought to strengthen the ability of the Secretariat for Integrated Rural Development (SEDRI) to coordinate extension by various implementing agencies. A second project, Rural Technology Transfer System (RTTS), sought to strengthen the capability of public agencies—first SEDRI and then the National Science and Technology Council (CONACYT) and Ministry of Agriculture (MOA)—to assist implementing agencies in improving technology transfer and linkage of REE institutions. But USAID/Ecuador's efforts to develop public sector ability to coordinate agricultural TG&T repeatedly were frustrated during the early 1980s. A mid-1984 evaluation recommended a major redesign that marked a shift away from these projects' initial *extension* focus and toward an emphasis on *education* through provision of opportunities for in-country and U.S. short-term and degree training. Training also was reinforced by Mission support of an

Agricultural Education project that funded scholarships for Ecuadoreans to study at the Pan American Agricultural School (EAP) in Honduras.

The 10/85 amendment of the RTTS project revised the project's strategy to place greater emphasis on working with private sector producer associations. While a public agency (MOA) continued to be RTTS' lead institution, the project assisted producer associations to carry out commodity-specific TG&T activities [later called Research Extension Linkage Units (RELUs)], assisted by the University of Florida and Utah State University. The RELU activities proved successful over the next few years and led to a 5/88 project amendment to establish a self-sustaining private sector technology validation and transfer system. The RELU concept became a key component of a private sector agricultural research foundation (FUNDAGRO) created under the Agricultural Research, Extension, and Education project (see below).

But even as USAID/Ecuador sought to strengthen public sector TG&T capability for food commodities, the Mission, under the Non-Traditional Agricultural Export (NTAE) project, began to focus on NTAE crops. A strategy of technical assistance to private groups (e.g., Federation of Ecuadorean Exporters) reflected a growing emphasis on providing development assistance through private organizations. Yet the mid-1988 NTAE evaluation concluded that more time and resources would be needed to develop private sector ability to achieve NTAE project objectives. Indeed, the evaluation stated that the Mission's strategy of turning to the private sector had not provided any "magic bullet" for solving the institutional problems that other projects (IRD and RTTS) already had encountered in trying to work through public agencies.

The launching of the Agricultural Research, Extension, and Education (AREE) project in 1988 further evidenced the Mission's growing private sector orientation. AREE, which seeks to improve a public-private TG&T system for certain commodities, is being implemented by the private Foundation for Agricultural Development (FUNDAGRO) that grew out of the Mission's frustration with Ecuador's public agricultural research institute (INIAP). While the Mission partially funds FUNDAGRO, a recently completed Agricultural Sector Assessment (Whitaker, et al., 1990) pointed to a need for increased public support for agricultural research and science. The assessment identified Ecuador's inadequate science base and discriminatory macroeconomic policies as the two major constraints to agricultural progress. Based on this assessment and a series of Mission-sponsored policy dialogue seminars, the Minister of Agriculture requested technical assistance to implement a plan for an autonomous National Research Service to replace INIAP. Also, the Mission has begun to explore the potential of non-project sector assistance (NPSA) to stimulate development of Ag REE in Ecuador (Brown, 1990b, 1990c).

c. Perú

USAID/Perú provided support, during much of the 1980s, to strengthen public sector Ag REE organizations. From 1980 to 1989, the Agricultural Research, Extension, and Education (AREE) project assisted the National Agrarian Research and Promotion Institute (INIPA) in developing public agricultural TG&T capability. Mission

support for public agricultural research and extension was to continue under the follow-on Agricultural Technology Transfer (ATT) project that had been designed by mid-1987. But, in late 1987, agricultural extension was pulled from INIPA and placed in the MOA, and INIPA was renamed the National Institute for Agricultural and Agro-Industrial Research (INIAA). Further, about the same time, Perú failed to meet U.S. Government drug certification requirements, and also fell in arrears on loan repayments; as a result, the Foreign Assistance Act's Brooke-Alexander amendment required AID to cut off funding for USAID/ Perú's bilateral projects with the Government of Perú.

This led the Mission to redesign the ATT project, whereby the implementing agency was changed from INIAA to the Foundation of Agricultural Development (FUNDEAGRO), the creation of which had been earlier assisted by the Mission.[14] The redesigned ATT project contract, signed with FUNDAGRO in late 1988, was to assist in improving TG&T links between FUNDEAGRO, INIAA, and the private National Agrarian Organization (ONA), with the primary emphasis being on channeling AID funding to support private TG&T through private groups—Ingeniero Agrónomo associations, producer associations, and irrigation users districts, with some funding going to INIAA to support participation of agricultural researchers from that organization.

It should be noted that the AREE and ATT projects also provide funding to strengthen agricultural education institutions such as the National Agrarian University (UNA). Further, these projects and Agricultural Planning & Institutional Development have funded advanced degree training either in-country or in the U.S. Thus, in retrospect, both the AREE and the ATT projects provided assistance to strengthen all three REE functions. However, while the AREE and ATT projects focused on strengthening Perú's TG&T capacity, this capacity also was strengthened through area-specific projects such as Upper Huallaga Agricultural Development and Central Selva Resource Management. The former project, as in USAID/Bolivia's Chapare Regional Development, sought income alternatives to coca production, while the latter, as in the Associated High Valleys component of the Chapare project, sought to address poverty problems in a related region (i.e., Perú's high jungle region). More recently, there is increased recognition of the need to address natural resource problems.

The Mission's Semiannual Project Report (USAID/Perú, 1989) stated that AREE had been "successfully completed" and that the end-of-project evaluation had "served to document the extent of success and provide guidance to the current ATT Project." ATT was reported to have developed "productive, collaborative relationships with all participating institutions." Further, it was stated that the project was expected during the next reporting period "to begin impacting at the goal and purpose level." At the same time, the documented assessed progress with respect to the fifth objective of the ATT project's technology generation component, namely, that INIAA's national programs develop a sufficient degree of maturity to ensure continued political and financial support, adequate to sustain the level of effort

[14]FUNDEAGRO grew out of an earlier foundation (FUNSIPA) created as a way of moving private funds to support research within INIPA.

existent at the project's conclusion. On this count, the report stated that a forum of former INIAA chiefs had discussed future needs and goals and that all had mentioned:

> that INIAA still has the same problems as it did five years ago and, before anything can be accomplished, these problems need to be resolved. Their concerns included the lack of resources, too many of the same experiments tested at different experiment stations, lack of publications, and lack of awareness of farmers' needs (USAID/Perú, 1989:21).

While the Semiannual Project Report identifies progress areas, there appears to be some uncertainty about whether the government will be willing and able, by the PACD of August 31, 1993, to make a commitment to sustain the publicly-funded Ag REE system.

By comparison with the case of Colombia, reviewed in section III.A, USAID/Perú's program during the 1980s did not go through a sequential evolution of initially focusing on one function (e.g., extension) and later on others (education or research). However, while support initially was aimed at strengthening public sector agricultural TG&T (INIPA renamed INIAA), Mission support for strengthening Perú's agricultural TG&T capacity was redirected in the late 1980s toward supporting private agricultural TG&T implemented through FUNDEAGRO.

Comparison of the Peruvian and Ecuadorean cases reveals that USAID/Perú sought to develop TG&T capability primarily in public sector agencies. FUNDEAGRO provided a mechanism to ensure a more efficient channeling of donor funding to public sector research by INIAA. USAID/Ecuador initially sought to strengthen REE capability by working through public organizations, subsequently through public sector organizations coordinating a mix of public and private agencies, and finally through a private sector foundation (FUNDAGRO) that has a mandate to work through both public and private institutions. Yet the GOE now is interested in creating an autonomous National Research Service to replace the existing public research organization (INIAP).

Projects in Ecuador (AREE) and Perú (ATT) have sought to increase private sector involvement in TG&T activities, although this appears to have been more aggressively pursued in the AREE project than in the ATT project which initially was designed to support the development of public sector agricultural TG&T. Subsequently, however, a series of events—the removal of the extension function from INIPA and its placement under the MOA, the renaming of INIPA to INIAA, and the failure of Perú to comply with drug certification and loan repayment requirements—led the Mission to shift its support for developing TG&T capacity to the private sector FUNDEAGRO.

d. Andean Region Summary

Efforts are underway in all three Andean countries to develop improved agricultural TG&T systems. There is increasing emphasis by the USAID Andean Missions on developing the capability of private organizations (i.e., foundations and PVOs) to carry out TG&T activities. In both Bolivia and Ecuador there are proposals to renew efforts to

strengthen public agricultural TG&T capability. Proposals for Bolivia call for restructuring IBTA, either in specific regions or nationwide. In the case of Ecuador, there is a proposal to create a new autonomous National Research Service. But USAID/Ecuador and USAID/Perú have placed increasing emphasis on private agricultural research foundations (FUNDAGRO in Ecuador; FUNDEAGRO in Perú) initially established and operated with AID support. The possibility of using non-project sector assistance (NPSA) to stimulate Ag REE-strengthening is being explored by USAID/Ecuador.

These three relatively large and resource-rich Andean countries have not been able to establish a satisfactory track record vis-à-vis the performance of and governmental support for public sector TG&T organizations. This situation reflects a continuing discussion about whether there is need for public involvement in agricultural research. There also is a lack of consensus on what should be the appropriate role or optimal scale of public involvement in agricultural TG&T. The situation exists largely because there is no consensus on the criteria that should be used in deciding what kind of public sector research capacity is most appropriate in each country situation.

Generally, each of these three Andean countries has tried at one time or another to develop a "National Agricultural Research System" (such as ICA in Colombia) that far exceeded the government's willingness and/or ability to support it. In effect, as far as public sector agricultural research and extension are concerned, these countries have had *más voluntad que billetera* (more will than wallet). Yet each of these countries minimally requires a measure of "downstream" research capacity, that is, ability to reach out and interact with external technology sources (IARCs) in order to import potential productivity-increasing technologies and adapt these technologies to site- and situation-specific conditions. But what is lacking is a consensus on the extent to which each of these countries also need to develop a measure of "upstream" research capacity to carry out more applied or basic research. There also is a lack of consensus on the extent to which the TG&T system should be publicly supported.

The case of Ecuador is illustrative. Brown (1990c) notes that INIAP was one of the premier public sector agricultural research organizations in Latin America; today INIAP is struggling to survive. As Venezian and Mocada (1989) have noted:

> The weakness of INIAP is caused fundamentally by the drastic reduction of its budget in the last eight years, which was not accompanied by equivalent adjustments in the size of its programs and the number of personnel; this has resulted in low remuneration and scarcity of operational resources, with the consequent loss of the best qualified investigators, and the loss of drive and corporate spirit of the institution.

The unsuccessful struggle to adjust to a continuous decline in financial support during the 1980s drained away managerial as well as scientific talent, and drastically reduced scientific output and reputation. The decline of INIAP was exacerbated by political interference in the institute's operations, and by the rigidities of a civil service system which prevented providing competitive remuneration to government employees.

The Ecuadorean case (INIAP), and also those of Bolivia (IBTA) and Perú (INIPA renamed INIAA), illustrate a basic inability to develop sustained political support for publicly-funded Ag REE organizations. This was an influencing factor in leading USAID in Perú and Ecuador to turn to creating and supporting private research foundations (FUNDAGRO, Ecuador; FUNDEAGRO, Perú). While FUNDAGRO evidenced at least an ability to coordinate research that is of a more "downstream" or adaptive nature, the current system is not structured to meet Ecuador's existing or potential needs for research of a more "upstream" nature—both applied and basic. Indeed, Ecuador's inadequate science base was identified in the recent agricultural sector assessment as one of the two major constraints to progress in Ecuadorean agriculture.

In the case of Bolivia, even with the very favorable macroeconomic policy environment that has been established, progress in the agricultural sector is severely constrained by a weak public TG&T system (i.e., IBTA) and a weak private sector. Bolivia is the only AID-assisted Andean country where AID has not opted to establish a private agricultural research foundation. Rather than tackling the issue of the kind of program the Mission should support with respect to strengthening Ag REE in Bolivia, USAID/Bolivia has based its agricultural portfolio on the Private Agricultural Producer Organizations project, which is aimed at strengthening the capacity of private agricultural producer organizations (PAOs) to deliver private sector goods and services to organization members. But compared with USAID/Ecuador's RTTS project, which assisted Ecuadorean producer associations in implementing agricultural TG&T activities (i.e., the RELUs), the PAO project was not designed to include a role for or to assist PAOs in developing TG&T activities. Differing World Bank and ISNAR recommendations on restructuring IBTA reflect a lack of consensus on what should be the appropriate role and optimal scale of public sector involvement in agricultural TG&T.

This situation exists, in large part, because there is no consensus on the criteria that should be used to decide what kind and scale of public sector research capacity is most appropriate in the case of Bolivia. Currently support for strengthening the TG&T capacity of IBTA is being driven by political pressure on the Mission to support the Chapare Regional Development project in finding crop and technology alternatives to coca production. Yet, in terms of developing long-term capacity of Bolivian Ag REE institutions to carry out TG&T, neither the PAO nor the Chapare projects provide opportunities for Bolivians to obtain the advanced degree training essential for developing science-based agricultural TG&T systems.

2. Caribbean Region

By comparison with the large Andean countries (Bolivia, Ecuador, and Perú), USAID Missions in the Caribbean region must focus on a diverse mix of relatively small island countries—Dominican Republic, Haiti, Jamaica, and the Eastern Caribbean island states (Antigua, Dominica, Montserrat, St. Kitts-Nevis, St. Lucia, and St. Vincent) that are assisted by AID's Regional Development Office for the Caribbean (RDO/C).

a. Dominican Republic (DR)

USAID/DR support for Ag REE in the 1980s initially was provided through the Natural Resource Management (NRM) project. But NRM supported implementation of project activities that lacked an institution building objective. A Natural Resources Planning & Development subproject emphasized basic data development such as agricultural zoning studies to determine priority farming areas and profitability of selected plant species. An education component focused on developing plans for and training people to carry out environmental education, while an extension component was limited to soil and water conservation.

NRM's Soil & Water Conservation subproject focused on agricultural TG&T through the subproject's hillside farming systems research (FSR) program, pilot extension programs on conservation, and short courses for paratechnicians. While NRM emphasized the DR's natural resources (soil, water, forests), Inland Fisheries focused on the DR's potential to produce fish in ponds. Another water-related project, On-Farm Water Management (OFWM), focused on the potential of irrigated agriculture and included research, extension, and education components. The former project (Inland Fisheries) was implemented by an NGO, while the latter (OFWM) was implemented by a public agency.

During the mid-1980s, USAID/DR began to turn its attention to a more systematic approach to developing the TG&T capability of Ag REE institutions. The Agricultural Research and Extension (517-0180) project was designed during this period but apparently was not implemented. The project's design provided for creating an autonomous institute to strengthen private and public agricultural research and extension capability. But the Mission decided to pursue this objective not through a public institution but rather through creating a private Agricultural Development Foundation (ADF). Subsequently the ADF was implemented under the Agricultural Technology Development (ATD) subproject of the Commercial Farming Systems project. The ADF initiative emphasizes reliance on a private sector-led institution to guide and finance agricultural TG&T, with a focus on collaborative on-farm research involving agribusinesses and outgrowers.

While ATD does not include a strong education component, support for agricultural education (opportunities for advanced degree and in-service training) has been provided under two projects, Agricultural Sector Training and Agribusiness Training.
The former project, Agricultural Sector Training, provides support for establishing ongoing systems for assessing training needs as well as for financing overseas M.S. and Ph.D. training, with the objective of having participants, upon completion of their degrees, return to the DR to help establish new graduate programs in agricultural science. The project design also provides for establishing a Fund for Advanced Education to finance M.S. scholarships and in-country thesis research. The latter project, Agribusiness Training, supports development of short-cycle training by the Superior Institute of Agriculture (ISA), a private agricultural higher education organization that received considerable Mission and donor support during the 1960s-1970s. While providing short-cycle training for agribusiness owners and managers, Agribusiness Training also is developing opportunities for private sector research.

Thus, USAID/DR support for Ag REE is split between the Commercial Farming Systems project that is strengthening the ADF's research and extension capability and projects such as Agricultural Sector Training and Agribusiness Training that provide opportunities for advanced degree and short-cycle training. The latter project also strengthens ISA's Ag REE capability.

b. Haiti

USAID/Haiti's projects during the 1980s have not had an institution building goal vis-à-vis Ag REE. Generally, Mission projects focused on providing the specific inputs needed to implement projects, albeit the implementor public or private. From 1980 to 1988, Agricultural Development Support II (ADS), implemented by the Ministry of Agriculture, provided support for a farming systems research and extension approach to development of recommendations on technological "packages," primarily for subsistence food crops (e.g., maize) but also for export crops (e.g., coffee) and forestry.

During the middle part of the decade, the Mission began, under NGO Support I, to focus on nontraditional agricultural export (NTAE) crops (e.g, winter vegetables). This project, by comparison to ADS, placed greater emphasis on working directly with the private sector, with the project's technical assistance being provided by Agricultural Cooperative Development International (ACDI). A third area in the Mission's agricultural portfolio during the 1980s was forestry, initially as part of ADS II and later under the MOA-implemented Agroforestry Research project and privately-implemented Target Watershed Management project.

While the MOA's agricultural research division (SERA) was to have been reorganized under ADS, the Mission's agricultural projects placed little to no emphasis on building public or private institutions to carry out research or extension, and none of the projects focused on agricultural education. The lack of emphasis on institution building also was evidenced in reliance on ACDI for implementing the NTAE initiative and the University of Maine for conducting an agroforestry research program. Generally, the Mission placed increasing emphasis over time on working with PVOs rather than with the MOA, this being determined, aside from any inherent frustration associated with working with the MOA, by a congressional restriction on making U.S. funds available to the Haitian government.

c. Jamaica

USAID/Jamaica support for Ag REE-strengthening initially focused on implementing the Agricultural Education project (upgrading the College of Agriculture and its feeder secondary school). The project evaluation found "a lag in...applied research" to be a constraint on implementing the project's extension component. But the need for more emphasis on research was recognized earlier, when the Mission launched the Jamaica Agricultural Research project implemented by the private Jamaica Agricultural Development Foundation (JADF). JARP supports adaptive research in farmer fields. Also, the project's commodity focus includes research on crops currently exported and/or which have export potential. Hillside Agriculture, implemented by the MOA, focuses on testing and promoting

perennial cropping systems and improved tree crop practices appropriate to the fragile hillside ecology of Jamaica's watersheds.

d. Eastern Caribbean

From the late 1970s through most of the 1980s, RDO/C supported the Caribbean Agricultural Extension Project (CAEP) (Phase I, 1978-81; Phase II, 1982-1989). CAEP was a regional project to strengthen the national-level public sector extension systems and to promote private agricultural extension. CAEP encouraged these systems to establish links with the University of the West Indies (UWI) and the Caribbean Agricultural Research and Development Institute (CARDI) and provided funding support for degree, in-service, and graduate (or postgraduate) training as well as for workshops.

Since the late 1970s RDO/C also has supported projects to strengthen agricultural research in the Eastern Caribbean—Small Farms Multiple Cropping Systems Research project (1978 to 1982) and Farming Systems Research and Development (FSRD) project (1983 to 1989). FSRD was directed at developing a farming systems R&D program in CARDI; it also included extension and education. A 1987 FSRD evaluation concluded that the project's design had been "too ambitious and unrealistic," especially in regard to time frame, counterpart availability, financial support, and project sustainability. Also, the amount of development effort needed to validate the technologies was underestimated. Yet the Final Report found that FSRD had developed improved technologies adopted by farmers. Further, FSRD had strengthened CARDI's ability to support FSR/E through an annual planning, budgeting, and reporting process; a microcomputer-based management system and strategic plan; a performance appraisal system; and a planning and evaluation unit.

CARDI sought to provide regional service for research, extension, and training. This was the strategy of Food Crop Production during the late 1980s. This project sought to establish applied research, demonstrations, and training in selected food crops, in order to develop small farmer food cropping systems in three pilot territories (Belize, St. Kitts, St. Lucia). This approach continues in the Agricultural Research and Extension (AREP) project that is being implemented by CARDI, UWI, and national MOAs. The project emphasizes CARDI's role in: (1) coordinating multi-country collaborative research networks; (2) participating in development of FSR methodology to generate alternative technologies and production systems for specific target farmer groups; and (3) testing these technologies at experiment stations and validating the technologies on-farm. Further, AREP provides support for strengthening UWI extension/education capabilities.

In the past, RDO/C support for agricultural research and extension was split between two projects—in the 1970s, between Small Farm Multiple Cropping Systems Research and CAEP; in the 1980s, between CAEP II and Farming Systems Research and Development. But RDO/C's current support for research and extension is channelled through one project (AREP) that provides support for CARDI (for research) and UWI (for extension and education). Also, the project is providing regional support to strengthen the capability of national-level extension systems to transfer technologies generated and validated through CARDI's ongoing FSR program.

RDO/C's strategy in the 1980s was to provide long-term support for Ag REE-strengthening, directing this support through regional institutions (CARDI and UWI). Further, under policy guidance from the Organization of Eastern Caribbean States (OECS), there is a mandate for these regional institutions to place increased emphasis on TG&T for NTAE crops. This will be given further impetus in the 1990s in the West Indies Tropical Produce Support Project (TROPRO).

e. Caribbean Region Summary

USAID support for strengthening the TG&T capability of Caribbean Ag REE institutions during the 1980s varied significantly across the four Missions. Support was weakest in Haiti, where the Mission's projects placed little to no emphasis on building public or private institutions to carry out research or extension and no projects focused on education. Typically, Mission resources were aimed at supporting specific projects, although the MOA-implemented Agricultural Development Support (ADS) project, from 1980 to 1988, supported a FSR/E approach to developing recommendations on technological "packages," primarily for subsistence food crops (e.g., maize) but also for export crops (e.g., coffee and sugar cane). Over time, increasing emphasis was placed on NTAE crops (e.g, winter vegetables), agroforestry, and watershed management, as well as on working with the private sector (NGOs/PVOs) rather than through the MOA.

A different pattern was observed in the Dominican Republic and Jamaica. In both cases, USAID began in the 1980s to move away from traditional project approaches that provided assistance to Ministries of Agriculture and to more toward supporting the development of private sector capability to carry out TG&T on NTAE crops [the Agricultural Development Foundation (ADF) in the Dominican Republic and the Jamaica Agricultural Development Foundation (JADF) in Jamaica]. Also, both Missions sought to strengthen agricultural education [Superior Institute of Agriculture (ISA) in the Dominican Republic and College of Agriculture in Jamaica]. While Mission support for private foundations strengthened agricultural research and extension for NTAE crops, the approach neglected the need to strengthen public sector TG&T capability for traditional food crops.

Compared with the private approaches to strengthening Ag REE in Jamaica and the Dominican Republic, RDO/C followed a regional approach to Ag REE-strengthening in the Eastern Caribbean. Mission support is channelled through a single project (AREP) that works with CARDI (for research) and UWI (for extension and education). The project continues the earlier established strategy of providing regional support to strengthen the capability of national-level extension systems to transfer technologies generated and validated through CARDI's FSR program. Now OECS is increasingly placing pressure on CARDI and UWI to develop a strong agricultural research and extension program on NTAE crops.

Looking across these four AID-assisted countries, the Dominican Republic, Haiti, and Jamaica illustrate the difficulty, in these relatively small and resource-limited island countries, of developing and sustaining public support for Ag REE. The relatively small size of these countries suggests that they may not have the scale of resource endowment required to support a full-scale Ag REE system of the type that larger and/or resource-richer countries

such as Brazil (EMBRAPA), (ICA), Mexico (INIA), or even some of the Andean countries can afford [Colombia (ICA)] or potentially can afford [Ecuador (INIAP)].

Further, the cost of agricultural research may be difficult to justify in cases (e.g., Jamaica) where it simply may be more economical to import food than to grow the same food locally. While this may make economic sense at one level, this approach hardly improves the income-earning potential of Caribbean farmers who are searching for ways to increase the productivity the same crops. From this standpoint, the smaller Caribbean region countries need to have some minimum capacity to access external technology sources (e.g., IARCs) and bring potentially improved technologies into their countries for "downstream" or adaptive research. But the increasing emphasis which Caribbean region USAID Missions have placed in recent years on supporting agricultural research on NTAE crops by private agricultural research foundations (e.g. ADF in the Dominican Republic and JADF in Jamaica) has resulted in a cutback in AID's traditional support for public sector agricultural TG&T for non-NTAE or subsistence food crops.

RDO/C has addressed this issue by supporting a regional approach to strengthen the TG&T capability of Eastern Caribbean Ag REE institutions. During the 1980s, RDO/C projects provided support for strengthening CARDI and the UWI. In turn, these organizations collaborate with public sector agricultural research and extension systems in the Eastern Caribbean island countries. None of these countries individually could afford an Ag REE capability of the scale provided by CARDI or the UWI. But Agency support of CARDI and UWI provides these island countries with access to adaptive, applied, or basic research capability that they individually cannot afford. But neither CARDI nor UWI can count on RDO/C to provide funding support in perpetuity. Hence both these institutions and their client countries need to be concerned about developing ways to ensure the long-term sustainability of the TG&T capability provided by CARDI and UWI. In turn, the extension services of the individual Eastern Caribbean islands must have sufficient TG&T capability to be able to interact and collaborate with CARDI and UWI in carrying out "downstream" or adaptive research. Other AID-assisted countries in the English-speaking Caribbean, such as Jamaica or even Belize, could become more actively involved in the development and support of a CARDI-coordinated regional Ag REE system.

3. Central American Region

a. Belize

USAID/Belize support for Ag REE-strengthening has been directed primarily to providing inputs to support project implementation by public or private organizations. Some projects provided funds to support degree-level training, but the principal emphasis has been on extension or technology transfer to support improved production. Excepting Livestock Development, which supports extension training at the Belize School of Agriculture and development of the school's forage and pasture curricula, Mission projects generally have not aimed at public or private Ag REE-strengthening. As an

English-speaking country, Belize looks to CARDI for technical support on food (staple) crops; for NTAE crops, emphasis in recent years has been on working with the private sector.

b. Costa Rica

USAID/Costa Rica support for Ag REE-strengthening has been limited to meeting specific technical assistance objectives (special studies, adaptive research, technology transfer, or training) involved in developing NTAE crops. Mission support for the Agricultural Diversification Program of the Costa Rican Coalition for Development Initiatives (CINDE/DIVAGRI) has not been aimed at strengthening DIVAGRI as a research, extension, or education organization *per se*, since DIVAGRI's agenda and activities are driven by market development opportunities and needs for NTAE crops, not by a mandate to conduct research, perform extension, or serve as an educational or training institution. However, several ROCAP projects provide funds to support projects implemented by organizations such as CATIE and EARTH which are located in Costa Rica. These are discussed below under Central America Regional. Also, some adaptive research is being carried out under contract with the University of Costa Rica.

c. El Salvador

USAID/El Salvador support for Ag REE-strengthening initially was provided through the Agrarian Reform Sector Support project which assisted in strengthening the National School of Agriculture (ENA) and funding NTAE activities of the Agricultural Diversification Program (DIVAGRO) of the Salvadoran Foundation for Economic and Social Development (FUSADES). Also, the Agribusiness Development project has supported DIVAGRO's work with the private sector on NTAE crop development. The emphasis on the private sector also is found in the Water Management project (which has provided opportunities for private sector support of thesis research by ENA students) and will be emphasized in three other Mission projects—Coffee Technology Enhancement, Commercial Farming, and Sustainable Agricultural Production.

Since the 1970s, when USAID/El Salvador supported projects to strengthen the physical and institutional structure of the Agricultural Technology Center (CENTA), the public sector agricultural research and extension organization, none of the Mission's projects have been aimed at strengthening CENTA. In recent years, the Mission has expressed concern over CENTA's performance. While a PID for a project to create a private Agricultural Development Foundation was prepared in late 1988 (Hertford, Brown, and Moscardi, 1988), a decision was not made to prepare a PP for this project. Recently the Mission began to explore assisting the Ministry of Agriculture and the Entrepreneurial Foundation for Educational Development (FEPADE) with pre-design studies leading to development of a strategy to privatize ENA (Byrnes, 1990c).

d. Guatemala

USAID/Guatemala support for Ag REE-strengthening primarily has been directed at public institutions—the Institute of Agricultural Science and Technology (ICTA), the Directorate General for Agricultural Services (DIGESA), and the Directorate General for Livestock Services (DIGESEPE), with funding provided by the Small Farm Diversification Systems (SFDS) project, which supported a mix of REE activities. But a 1986 SFDS evaluation found that progress in adaptive research and technology development had been slow because SFDS's design mistakenly assumed that ICTA had sufficient technological information to undertake a crop diversification program. The evaluation indicated that ICTA had little experience in this area and was reluctant to provide production recommendations. A second project, Highlands Agricultural Development (HADS), has a mix of research, extension, and education activities, implemented by public sector agencies. But a 1987 project evaluation found that, once farmers were provided assistance for building irrigation systems, extension agents did not provide adequate follow-up extension.

Two projects having extension and, in some cases, research components were Aquaculture Extension and Guatemala Dairy Development. Development Training and Support was implemented by a PVO but focused on agricultural education; the project also funded a program providing partial (70%) scholarships for students to attend the Pan American Agricultural School in Honduras. The project also supports and M.A. and Ph.D. training for university faculty members.

USAID/Guatemala interest in working through private organizations continues into the 1990s. The Mission has been exploring the possibility of creating a mechanism to assist in developing leadership and funding for TG&T on NTAE crops. This mechanism has been called a "Research Fund for Non-Traditional Agricultural Exports," a "Research and Technology Transfer Foundation" and an "Agricultural Research Foundation" (O'Donnell, 1989; Lamb, 1989; Martinez, 1989; Lamb, 1990; Mondoñedo, 1990).

e. Honduras

USAID/Honduras support for Ag REE-strengthening has focused on a mix of objectives: (1) TG&T for small farm agriculture; (2) NTAE crop development; and (3) agricultural education. Rural Technologies, implemented by the public sector Center for Industrial Development, focused on TG&T for small farm agriculture. The project's success, as seen by the final evaluation, was due to having adopted a farming systems approach. Natural Resources Management, also implemented by public agencies, focused on transfer of appropriate technologies to small subsistence farmers in Choluteca. Integrated Rural Development, an NGO subproject, had an agroforestry component.

In NTAE crop development, Mission support was provided through the creation of a private agricultural research organization, the Honduran Agricultural Research Foundation (FHIA). While FHIA will continue receiving Mission support under the Agricultural Research Foundation project until 1994, USAID/Honduras is now working with FHIA to

establish an endowment that would provide funding to support FHIA after the current project ends.

In agricultural education, the Mission has provided support at several levels. The Rural Pilot Schools Development project, implemented by CARE, Peace Corps, and the Ministry of Education, focused on providing primary school classes in agriculture. Another PVO project, S.O.S. Training of Migrant Youth, assisted the Sociedad Amigos de Los Niños of the Aldeas S.O.S. Farm Village to expand and improve its educational, vocational, and agricultural training for abandoned and orphaned children. Agricultural Education, implemented by the private University of San Pedro Sula (USPS), sought to strengthen USPS's Agricultural School. The Mission's Pan American Agricultural School project provided funding for EAP's Integrated Pest Management (IPM) program.

Generally, in projects involving public sector implementing agencies, funding has been aimed at supporting project activities and *not* on any objective of strengthening the capacity of the Secretariat of Natural Resources to carry out agricultural TG&T. By comparison, the Agricultural Research Foundation project, implemented in the private sector by FHIA, is an institution building project that seeks to develop FHIA as a self-sustaining TG&T organization. From 1985 to 1990, the Mission provided funding for development of FHIA's Communication Unit, as a buy-in to S&T's Communication for Technology Transfer in Agriculture (CTTA) project: CTTA also carried out development, adaptation, and field testing of methodologies for agricultural technology transfer to small farmers in the Comayagua Valley.

f. ROCAP

USAID/Regional Office for Central America and Panamá (ROCAP) funded several projects that included research, extension, and/or education components, with implementation carried out by regional organizations—the Tropical Agricultural Research and Training Center (CATIE) and the Interamerican Institute for Cooperation on Agriculture (IICA). Several general observations follow:

- Projects typically have focused on traditional export crops and/or problems common to several countries in the Central America region [e.g., coffee, cacao, fuelwood (tree crop) production, and integrated pest management (IPM)].

- Crop-specific and problem-focused projects have tended to include all three REE functions:

  Research: Project support has emphasized development of research networks between and among collaborating national-level public agricultural research systems.

  Extension: Project support has emphasized appropriate means (demonstrations, printed materials) to disseminate improved technologies and research information.

Education: Project support has emphasized a mix of short courses, seminars, and degree training.

- Higher agricultural education is one of the major areas of funding. CATIE receives a major share of its budget, both project-specific and core, from the Regional Agricultural Higher Education project. The Agricultural School for the Rural Humid Tropics (EARTH) was funded by ROCAP, while the Pan American Agricultural School (EAP or Zamorano) in Honduras also receives ROCAP funding.

- While country-specific Missions have implemented projects through either public or private agencies, ROCAP-funded projects have, as a function of the Mission's regional approach, tended to work with public rather than private organizations.

ROCAP also has supported NTAE development through the Non-Traditional Agricultural Export Support (PROEXAG) project. The project primarily aims at helping private growers and exporters to learn the art of "deal making" vis-à-vis importers in destination markets. PROEXAG's deal-making assistance is complemented by technical assistance to NTAE organizations (e.g., DIVAGRI in Costa Rica) to strengthen national capability to support local NTAE industry growth.

But PROEXAG's assistance is not aimed at strengthening any research institution. Rather PROEXAG assists local NTAE industries to organize crop-specific research (e.g., asparagus variety trials; studies on melon virus control) carried out by growers in collaboration with local researchers. PROEXAG tends to rely on the capability of private producer associations and/or market channels as the mechanism to transfer research results and technologies to growers. Thus, technology transfer assistance is not directed at strengthening public sector extension organizations, although extension agents of a Ministry of Agriculture may participate in training programs organized by PROEXAG or national NTAE support organizations (Byrnes, 1987).

Most recently, ROCAP has been developing a Central American agricultural strategy for the Mission's Rural Development Strategy Statement (RDSS) for the period 1991-95. ROCAP's agricultural sector strategy focuses on three major objectives: (1) reversal of environmental degradation and sustainable management of natural resources; (2) expansion of nontraditional agricultural exports; and (3) enhanced agricultural productivity to maintain and expand comparative advantage, based on building a coherent Central American agricultural science, technology, and higher education system.

ROCAP's interest in Ag REE-strengthening in the Central American region reflects an emerging shift in the attitude of Central American governments toward agriculture and publicly-supported Ag REE institutions. Brown (1990d) reports that the presidents of the Central American countries, in their Plan de Acción Económico de Centroamérica (PAECA), emphasized a need for a coordinated agricultural policy (Article VII) and a regional science and technology policy (Article VIII). In the Declaración de Antigua, they reiterated that "we

have Central American pathways to peace and development," and expressed their willingness to pursue these paths, initially through their own efforts.

With this in mind, there is a desire on the part of ROCAP to provide strong support to Central American government efforts to develop a Central American network to generate and adapt agricultural technology to the region's agro-ecological conditions. While such a network must be attuned to the region's own needs, values, and capabilities, there is a recognition that this network must include, *inter alia,* a system of higher agricultural education to produce the professionals needed to design and execute science and technology programs.

Against this background, Brown (1990d) prepared a concept paper outlining the nature of the problem, the salient decisionable issues, and an approach for ROCAP support.[15] The paper was prepared as a step toward developing a series of deliberations that were to have the intended output of a comprehensive indigenous vision of a Central American agricultural research program, including its institutional composition, staff, physical facilities, operating and investment budgets, and an agenda for research. Also, as Brown proposes, the desired vision should set forth a rationale for the international scientific and donor communities to provide supplementary intellectual and financial resources. Further, as assessed by Brown, the desired vision would entail a recognition of: (1) the problem and (2) the issues, as follows.

(1) The Problem

The basis for continued comparative advantage in agriculture in Central America, for traditional and nontraditional exports as well as for domestic food and fiber, needs is yield-enhancing technology. Failure of any country to maintain its technological advantage leads to the loss of market share, reduced foreign exchange, lowered returns, constrained ability to import, devaluation, inflation, and poverty. Usurpation of markets for native Latin American products (e.g., rubber, corn, potatoes) by competitors who have been able to develop and apply superior technology is also manifested in the region as traditional producers complacently lose once-secure dominant positions in commodity markets to their more aggressive neighbors. The lesson is clear: the country which is able to continuously upgrade its agricultural productivity by using better technology is able to maintain a comparative advantage over those which don't.

Some, perhaps most, yield-enhancing technology is generated in advanced international and national research centers and can be imported to Central America. But all technology, whether it is imported or generated locally, must be tested and adapted to the particular ecological conditions where it is to be applied. Central America needs an effective combination of national and regional research networks attuned to its own needs, values, and

[15]The concept paper was prepared for ROCAP by Scaff Brown, agricultural policy advisor, Agricultural and Rural Development Technical Services (LAC TECH) Project. This section heavily draws from and adapts the ideas developed by Brown (1990d).

capabilities. Brown proposes that such networks must be defined by Central Americans as a precursor to soliciting assistance for their attainment—not imposed as a condition for aid.

Brown (1990d) notes that defining an agricultural research network for Central America is a Central American responsibility. Further, he notes that five decades of external encouragement and support of agricultural research failed to develop a sustainable and effective system to service the region's agricultural needs. Brown concludes that developing and maintaining a sustainable TG&T system must be based on Central American needs, values, and capabilities. In the process of defining these, Central Americans must acquire "ownership" of the system in order to commit their governments and peoples to its consistent support. The current situation which has been created by this Central American initiative provides a window of opportunity for ROCAP to provide the support necessary to enable Central Americans to develop such a program.

(2) The Issues

Central Americans must grapple with and resolve a number of persistent issues that have plagued development of a viable, productive research system in the region. The following issues are representative: (a) a persistent financial commitment; (b) a problem-oriented research agenda; (c) internal networks and external links; and (d) a regional center; and (e) higher agricultural education. Each of these is discussed below.

(a) A Persistent Financial Commitment

Agricultural research is generally considered to be a public good. While the private sector generates much technology in pursuit of gain via the sale of improved agricultural inputs (e.g., seeds, fertilizers, pesticides, drugs, equipment), the private sector cannot pursue research without hope of remuneration. Such research includes not only the technology of crop management but also adaptive testing of inputs in markets whose scope is too limited to be commercially attractive. The economies of scale for research favor a public sector approach, in order to serve large numbers of dispersed subsistence and commercial farms which individually cannot afford the cost.

Agricultural research is expensive and time-consuming. It requires a highly specialized staff of professional scientists who must be allowed to pursue a problem without interruption, in order to achieve a viable result which can be of broad economic benefit to farmers and consumers. Any interruption of research by staff transfers or lack of timely operating funds or inputs jeopardizes the potential for research payoff. Effective agricultural research requires an absolute commitment to a continued level of timely support, including competitive salary levels for research staff.

(b) A Problem-oriented Research Agenda

The scope of agricultural research is enormous, ranging through myriad individual commodities and processes, from fundamental science to infinite replications for different microclimates. The only reliable means for maintaining a

sustainable, cost-effective research system is to establish a system of priorities aimed at rapidly solving economically important problems associated with significant products and processes. Establishing such an agenda, and modifying it as problems are solved, requires close interaction among producers, scientists, and government leadership. It also requires superior management and decision making to terminate unprofitable or mature lines of effort and reallocate resources.

(c) Internal Networks and External Links

Agricultural research has become too complex to pursue in isolation, and too expensive for unbridled competition. Central American scientists pursuing similar lines of work must communicate through networks for mutual reinforcement and interaction. These networks, in turn, must be linked to the international scientific community (IARCs, NARCs, universities, and foundations) for access to the latest fundamental research output of these centers. Formation, maintenance, evaluation, and modification of these networks and links is essential for a sustainable Central American system.

(d) A Regional Center

The small size of the economies of the Central American countries limits their individual capacities to support fully adequate national research operations. Although some level of national research capability is required by the agro-ecological variability among the Central American countries, many common problems can be solved by regional networks and/or a center of excellence supported by all countries. Careful consideration must be given to the balance of support to national systems vis-à-vis staffing and funding networks and/or a Central American center.

A related issue is to resolve the status of CATIE as a regional center for Central America. The site on which CATIE is located was initially the headquarters of the Inter-American Institute for Cooperation on Agriculture (IICA). CATIE was subsequently divested to Central American management; however, the transfer has never been completed. Although CATIE has become a Central American center of excellence in tropical agricultural research and graduate level education, its sustainability remains precarious.

IICA continues to provide a major share of CATIE's inadequate core funding through a narrow formula acceptable to the Inter-American Board of Agriculture. It also lends international status to CATIE, which is still only legitimated by Costa Rican law. In return, CATIE has accepted disproportionate responsibility and exercised comparable authority over CATIE decision making. It is in the interest of Central Americans that they seek to clarify CATIE's status as a regional Central American organization, either through completion of divestment or reabsorption into IICA with greater funding. The current anomaly is untenable in the long run.

In this regard, it should be noted that the Central American Presidents have requested specifically that steps be taken leading to a redesign of regional organizations related to

education and scientific and technological investigations. It should be noted that since the completion of Brown (1990d) and the utilization of that report in preparing this section, ROCAP undertook to assist CATIE to develop a proposal for the Consultative Group on International Agricultural Research (CGIAR) to fund CATIE as the International Forestry and Agroforestry Center or a regional branch of such an international center (CATIE, 1991). If CATIE becomes one of the CGIAR-funded International Agricultural Research Centers (IARCs), there will be need to rethink the issues developed in Brown's concept paper (Brown, 1990d) and to identify how the need for regional support of national-level TG&T could best be supported.

(e) Higher Agricultural Education

The effective performance of quality agricultural research requires leadership by professional staff with extraordinary qualifications. Such individuals must have a unique combination of personal qualities enhanced by education and experience. The best scientific investigators are self-selected in graduate school, which requires the discipline of independent research under highly experienced and critical teachers. An ideal environment for developing such capacity begins at the undergraduate level. All students should receive a disciplined curriculum that includes basic sciences and mathematics as well as agriculture. The teaching staff should be rich with professors who themselves are deeply engaged in scientific investigation. Such professors not only impart to their students the excitement of research, but help to identify and encourage students with a genuine vocation for research. Students who graduate from the undergraduate level must have an opportunity to pursue their education in a suitable graduate school. Typical undergraduate institutions do not provide the competitive intellectual atmosphere and the extra training which can only be received in graduate school.

CATIE is the only Central American institution that provides such an environment, and it is currently limited to the M.S. level. A Ph.D. acquired at a leading international institution has become the generally accepted minimum qualification for senior assignments in superior institutions providing professional agricultural education and performing agricultural research.

Thus, any assessment of agricultural higher education in the Central American region must address several interrelated issues:

- Maintenance and improvement of undergraduate agricultural education in order to provide both suitably qualified professionals to manage the sector, and a smaller stream of future scientists;

- Steady growth of a highly qualified stream of candidates for the CATIE graduate program;

- An increasing number of fellowships for Central Americans qualified and aspiring to seek a Ph.D. abroad, in order to staff the region's universities and research organizations with suitably qualified individuals;

- Obtaining support for university research in a way that will optimize the utilization of scarce professional talent and enhance the quality of undergraduate and graduate education; and

- Competitive remuneration of highly qualified educators and scientists. The demand for such professionals is international. Failure to provide competitive remuneration leads to an inevitable loss to those who recognize the importance of science and technology to national development.

g. Central American Region Summary

USAID support for agricultural research, extension, and/or education carried out by public sector organizations in Central America is provided through ROCAP. ROCAP provides support for organizations such as CATIE and IICA that, in implementing projects, tend to work through public organizations at the national level.[16] The regional centers traditionally have focused on food crops and export crops (e.g., coffee). However, in recent years increased emphasis has been placed on natural resources (e.g., forestry, watershed management) and, recently, on nontraditional agricultural export (NTAE) crops. At the country level, USAID Missions reduced support for or terminated projects that were aimed at strengthening public agricultural research and extension organizations.

This tendency to reduce or terminate support for public agricultural research and extension followed on USAID frustration with the performance of national governments in supporting agricultural research and extension (Sarles, 1987). For example, the poor performance of the Government of Panamá in supporting the Agricultural Research Institute (IDIAP) and the Ministry of Agricultural Development (MIDA) resulted in pressures by USAID on a team evaluating the Agricultural Technology Development and Agricultural Technology Transfer projects to recommend that the projects be canceled if the GOP could not meet several conditions (Byrnes, et al., 1987).

Support for Ag REE-strengthening vis-à-vis NTAE crops was and continues to be provided mainly through country-specific projects implemented by private organizations, including FHIA in Honduras, DIVAGRO in El Salvador, and DIVAGRI in Costa Rica. FHIA was established as an "agricultural research foundation" in 1984 and there have been efforts to establish similar foundations in El Salvador and Guatemala. Sarles (1990) provides a review of "USAID's Experiment with the Private Sector in Agricultural Research in Latin America and the Caribbean." However, each of the AID-assisted NTAE organizations faces a long-term problem of how to ensure sustainability beyond the life of the AID project funding currently supporting them.

Several ROCAP projects provide funds to support projects implemented by several regional organizations (CATIE, EARTH, and IICA) located in Costa Rica. One of these,

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[16] However, Belize as an English-speaking country tends to look to CARDI for technical support on food (staple) crops; similarly, the Dominican Republic, although located in the Caribbean, tends as a Spanish-speaking country to look to CATIE for technical support.

CATIE, is the premier agricultural research center for the Central American region. Further, CATIE offers advanced degree training at the M.S. level. The other organization, Regional Agricultural School for the Humid Tropics (EARTH), first began to operate in early 1990. At the technical school level, the premier agricultural education institution is the Pan American Agricultural School (EAP) in Honduras. ROCAP and individual USAID Missions provide support for EAP through project and/or scholarship funds. A third agricultural education institution, El Salvador's National School of Agriculture (ENA), has potential to develop education, training, and applied research for Central America's semiarid agricultural regions, focusing on irrigated agriculture, a specialization in which ENA now offers the "Ingenerio Agrónomo" degree. The capability to offer agricultural education in this area was developed under USAID/El Salvador's On-Farm Water Management project.

In general, the Central American region has witnessed a dramatic decrease during the 1980s in AID support for public Ag REE institutions at the national level and a dramatic increase in AID support for private sector organizations aimed at assisting in the development of NTAE crops. In many of the countries, there has been a traditional lack of commitment by the public sector to support of agricultural TG&T by publicly-supported Ag REE institutions. Most recently, ROCAP has expressed interest in strengthening Ag REE in Central America, this reflecting a change in Central American government attitudes about agriculture and publicly-supported Ag REE institutions.

There now appears to be a growing recognition of the need for continuing public involvement in agricultural research and agricultural higher education in the region. Brown (1990d) has pointed to the need for determining, within the region, the optimal scale of public involvement in agricultural research, as the optimal scale will vary from one country to the next, as a function of each country's resource endowments.

The small size of the economies of the Central American countries limits their individual capacities to support fully adequate national research operations. While some level of national research capability is required by the agro-ecological variability among the countries of the region, many common problems can be solved by a regional center of excellence (e.g., CATIE) and/or networks that involve the participation of public and/or private sector researchers. Careful consideration must be given to the balance of support to national systems vis-à-vis staffing and funding networks and/or a Central American center such as CATIE. Thus, criteria need to be established that will assist each country in deciding what kind of public sector agricultural research capacity building is most appropriate for each country situation.

C. Evolution of AID Strategy for Ag REE-Strengthening

Chapter II identified two major trends during the 1980s in the Ag REE components of USAID LAC Mission ARD portfolios. First, there was a *decline in the absolute amount of funding for Ag REE.* During the 1980s, USAID Missions in the LAC region experienced a decline in the absolute amount of funding allocated to Ag REE. This constituted a shift away from the years when funding was relatively plentiful and less of a constraint to project implementation and toward the situation faced today, a time when budgets are being cut and

the amount of money available for project assistance for strengthening Ag REE places severe limits on the objectives that can be pursued and the activities that can be supported. Second, there has been a *decline in the relative importance of Ag REE in Mission portfolios*, as shown by reduced funding for Ag REE as a percent of total development assistance funding. At the same time, funding grew in other areas such as policy dialogue, private sector, natural resources and the environment, and narcotics awareness.

Several variables appear to have been associated with the decline in support for Ag REE in LAC Mission portfolios. Review of these variables, identified on the basis of the preceding section's review of AID support for Ag REE-strengthening, as well as an analysis of LAC Mission Country Development Strategy Statements (CDSSs) (see Annex B), helps to delineate the evolving path of AID project support for Ag REE-strengthening in the LAC region. These variables, identified in the following discussion, have become increasingly apparent during the 1980s, although many of the shifts in program emphasis began or were in the making even earlier.

1. Growth vs Equity

There has been a dramatic shift away from AID's earlier efforts to reach "the poorest of the poor" via support for production (e.g., subsidized credit) and social welfare ("meeting basic human needs") and toward emphasizing economic growth, with an increasing percentage of development assistance resources allocated to other sectors ("getting the policies right" and private sector initiatives in microenterprise development). This shift also was reflected in a decreased emphasis on directing assistance to specific geographic target areas (to where the poor are located) and an increased emphasis on directing assistance to areas where economic growth opportunities are greatest (to entrepreneurs who have capital to place at risk in non-traditional investments).

This shift was sanctioned by changing Agency policy from an emphasis on "meeting basic human needs" and "reaching the poorest of the poor" during the 1970s and early 1980s, to an emphasis during the mid-1980s on the "four basic programmatic components" of the "Blueprint for Development" strategy,[17] to the Agency's current emphasis on "economic growth." As a recent AID report stated:

> Above all, successful development means successful growth; anything less is nothing more than a thinly disguised dole fostering dependence instead of development. To be distributed, wealth must first be produced. For poverty to be reduced, wealth must be increased. And the production of wealth—of economic growth and individual opportunity—is a vital factor in the development of strong, stable democratic social values (AID, 1989:119).

[17]The strategy's "four basic programmatic components" were: (1) increased reliance on the private sector and market forces; (2) technology research, development, and transfer; (3) institutional development and training; and (4) policy dialogue.

These changes in programmatic emphasis, as expressed in AID/Washington cable guidance for the preparation of Mission CDSSs, influenced problem definition, strategy formulation, priority setting, and project selection by the individual USAID Missions. Over time, there was decreasing recognition of the potential of Ag REE as an integral component of a country's development strategy or a USAID Mission's program of development assistance.

2. Private vs Public

There has been a shift away from strengthening public sector institutions (institution building at the national level) and toward working with and through, creating and/or strengthening, private institutions (foundations, PVOs/NGOs, cooperatives, and other types of farmer or producer organizations). In some cases, this trend was reflected in an increased emphasis on working with and through semiautonomous research institutes or decentralized organizations (e.g., "Departmental Development Corporations") and/or on developing "market towns" on the periphery, rather than further expanding central government bureaucracies. This trend involved decreased emphasis on fostering the participation of the resource-poor and increased emphasis on promoting participation of private entrepreneurs having sufficient resources to invest in potentially profitable but risky ventures responsive to market opportunities.

In any case, over time there has been a decreased emphasis on projects because of the inability of governments to meet recurrent expenditures. The end result was reduction in the level of AID funding support for public sector agricultural research organizations and a reorientation of AID resources, in many LAC countries, toward creating private sector agricultural research organizations that have the same problem of sustainability. Even as USAID Missions search for ways and means to ensure sustainability of these new organizations, there is a continuing need for most AID-assisted LAC countries to strengthen public sector TG&T capability, particularly in the food security crops (i.e., basic staple food crops) and resource management, two areas in which the private sector has little or no incentive to invest in research.

Further, there are more basic or applied areas of research, essential for backstopping the more applied or adaptive research involved in developing production and marketing of non-traditional agricultural export (NTAE) crops. But the private sector has no incentive to invest in more basic or applied research, and the public sector agricultural research system, already overburdened, lacks any direction in terms of setting realistic goals and priorities. For example, Brown (1990c) has pointed out that Ecuador's overburdened agricultural research system is attempting to carry out research programs on a diverse mix of more than 70 crops. Costa Rica began to recognize this same problem in 1988, when the Ministry of Agriculture's research program reduced its commodity list from 88 to 33 crops. The list was again reduced in 1989 to 20 crops, and an ISNAR review team recommended even further consolidation (ISNAR, 1990:31).

3. Implementation Support vs Institutional Development

There has been a shift in use of project funds away from Ag REE-strengthening (institution building) and toward supporting specific life-of-project activities. This trend has involved a shift away from projects based on the demonstration assumption and toward projects that subsidize private sector organizations to carry out activities which the public sector has not been willing and/or able to support on a sustainable basis. The "demonstration assumption" occurs when a donor assumes that a project it funds, often described as a "pilot project," has the potential of being so successful that the host-country government will be compelled, when donor funding ends, to step in and continue to provide the funding needed to support continued delivery of the services the project provided in the target area.

But LAC governments generally have been unable or unwilling to provide the funding essential for sustaining public sector Ag REE systems. LAC governments do not see Ag REE as a public good, while AID forgets that some needed TG&T activities will be undertaken only if the public sector provides the required funding. In other words, only some of the needed TG&T will be provided by the private sector; the public sector must be responsible for the balance. AID also forgot that private sector TG&T capacity will be weakened to the extent that the public sector lacks adequate TG&T capacity.

4. Regional vs National Systems of Education

There has been a shift away from emphasizing development of host-country agricultural education institutions (e.g., national agricultural universities) towards greater support for potential regional centers of educational excellence (e.g., EAP in Honduras as a potential regional center of excellence in IPM) and for existing regional agricultural education centers (e.g., UWI in the Eastern Caribbean and CATIE in Central America). There has also been a shift away from project funding for advanced degree training and toward project funding for short-term training needed to implement project activities. But this trend has served to weaken, if not reverse, the achievements in agricultural higher education institution building, made during the 1950s and early 1960s. With higher salaries in the private sector, there has been a decapitalization of human resources in national level agricultural higher education institutions. Even premier agricultural higher education centers (e.g., CATIE) are able to hire experienced staff for only as long as project funding is available.

Few, if any, higher agricultural education institutions in AID-assisted LAC countries are sufficiently developed to generate the full range of scientific manpower needed by the agricultural sectors of these countries; only CATIE offers training at the M.S. level. As Vessuri (1990:1549) notes:

> Only a few [LAC] universities seriously engage in research and the training of future researchers.... Today's universities must be refurbished in order for them to deliver not only the researchers, but also the entrepreneurs and administrators acutely needed

by [LAC] countries.... The region's institutions of higher education need to be improved, strengthened, and strategically led to serve effectively their host societies in the 1990s.

Another educational issue is that many LAC agricultural researchers were trained in the 1960s and early 1970s and have received little or no educational updating since their basic training. Even one of post-doctoral training for such researchers could have a high payoff. Donors such as AID should encourage assisted countries to allocate resources for this purpose and to work with international development agencies, bilateral and multilateral, to develop postgraduate training programs for selected researchers from the LAC region (Schuh and Angeli-Schuh, 1989:33). A closely related problem is that the skill mix of researchers often reflects science and technology needs as perceived 20 years ago, when these researchers received their scientific training. Given scientific and technological advances during the past two decades (e.g., biotechnology), a new mix of skills is needed. Some of these skills can be acquired through retraining programs as identified above. AID should explore ways to assist additional researchers to obtain in-depth training in the new skills. Also, significantly expanded national-level programs are needed. Regional institutions such as IICA, CATIE, CARDI, as well as university centers of excellence, should be encouraged to play a lead role in developing regional programs directed to this end (Schuh and Angeli-Schuh, 1989:33).

5. Market Orientation vs Commodity Orientation in Research

There has been an emerging shift away from public sector and researcher control over the research process and toward greater private sector and client control over agricultural research. This shift has involved increased emphasis on supporting research for crops for which there is a market demand (e.g., NTAE crops, traditional export crops and, in some cases, import substitution crops); channeling research support through private organizations (providing support for establishing and operating private agricultural research foundations); increasing the private sector's role in defining the problems on which research is needed and in setting the priorities for agricultural research; and gearing production to meet market demand, with a greater recognition of the need to address off-farm, marketing infrastructure problems (roads; transportation; assembly, storage, and processing facilities; and market information).

There also has been a shift in terms of a reduced emphasis on applied research at experiment stations and increased emphasis on adaptive research carried out on-farm, with farmers and extension agents playing a greater role in implementing and evaluating agricultural research. Yet there is a continuing need for TG&T for basic food crops. But the tens of thousands of commercial small farmers who grow food crops for the market have little, if any, say in ensuring that adequate resources are allocated for research on these crops or that they are effectively involved in the design, implementation, and evaluation of this research.

6. Technology Transfer Systems vs Public Sector Extension

There has been a shift away from primary or sole reliance on public sector extension as the primary vehicle to promote farmer adoption of improved agricultural technologies and toward more systemic approaches, with technology transfer involving multiple agents/channels and increased attention to the constraints that must be relaxed from the policy level to the farm level. Where agricultural systems are becoming more integrated, in the sense of purchased inputs comprising a larger percentage of the value of the inputs used by farmers, the potential for involving the private sector in TG&T increases, especially where private firms can recover R&D costs via embedding productivity-increasing technology in salable inputs. In recent years, ISNAR (Kaimowitz, Snyder, and Engel, 1989; and Pray and Echeverría, 1989) and IICA (Kaimowitz and Vartanián, 1990) have explored conceptual frameworks and strategies for greater private sector involvement in agricultural TG&T.

7. Market-researched vs Preconceived TG&T Models

There has been a shift away from promoting adoption or duplication of the Land Grant model of TG&T and toward increased emphasis on market-researched TG&T models. This has included increased AID support for developing research networks, farming systems research and extension (FSR/E) models, private agricultural research foundations, and the Communication for Technology Transfer in Agriculture (CTTA) project. *But there has not yet been an adequate synthesis of lessons learned and identification of how to apply these to the design of a strategy to guide AID funding for Ag REE strengthening in the LAC region.*

8. Broad Focus on Natural Resource/Environmental Sustainability vs Narrow Focus on Soil Conservation

There has been a shift away from a focus on soil conservation, either singularly or as a component of a project's objective to increase agricultural productivity, and toward increased emphasis on a broader concern with the protection of the natural resource base and environmental sustainability. One result of this shift has been the erroneous view, held by some, that agricultural production cannot be increased without sacrificing the environment. Further, AID has contributed to this erroneous perception by developing projects focusing primarily on natural resource management and the environment, rather than doing a better job of incorporating natural resource management and environmental conservation as integral components of Ag REE projects.

9. Policy Environment: Changeable Variable vs Unchangeable Given

There has been a shift away from attempting to implement projects within a given policy environment and toward working to change the policy environment through agricultural policy analysis projects and bilateral policy dialogue. But AID is not the World Bank, nor does the Agency command the kind or level of resources that are at stake when the Bank takes on structural adjustment in a country. AID's limited resources need to be

targeted on more limited objectives, but not so limited in vision as to believe that development follows simply by "getting the prices right" or even by "getting the policies right." AID-assisted LAC countries that seek to increase agricultural productivity and the agricultural sector's income-earning potential must also "get the institutions right." With respect to strengthening Ag REE institutions throughout the LAC region, there is great potential, within a properly structured policy environment, to "get the institutions right" and to, in Mosher's words, "get agriculture moving."

The recent work of Brown (1990a, 1990b, 1990c) in developing and applying the concept of non-project sector assistance (NPSA) points to a tool that USAID Missions could use to address basic policy and institutional problems that need to be corrected in order for Ag REE institutions to flourish.

10. Donor Interest vs Country Need

There has been a shift away from a USAID Mission's portfolio reflecting a country's needs and toward reflecting the interests of the U.S. as a donor country. This has been reflected in the U.S. Congress' tendency to earmark development assistance funds to focus on special problems of high priority concern to the U.S. Such concerns have included child survival, narcotics awareness (coca substitution), AIDS, natural resources and environmental sustainability ("global warming"), and the private sector, to name only a few earmarks. This shift in orientation to development assistance was reflected in AID's *Development in the National Interest* (AID, 1989).

As Gang and Lehman (1990) note in "New Dimensions or Not: USAID in Latin America," the U.S. Congress in 1973, directed AID to provide its economic aid to the poorest populations in the poorest countries. Did U.S. bilateral aid allocations to LAC countries satisfy this directive? To answer this question, the authors compared assistance given to LAC countries before and after 1973 as a function of four independent variables (child mortality, political stability, imports from the U.S., and GDP per capita). In their analysis, the dependent variable was the percent of all USAID loans and grants given to each LAC country. The study's results "suggest that USAID did not follow the congressional directive." Quoting from the study:

> Our analysis indicates that USAID policy has...ignored the 'new directions' envisaged in the Foreign Assistance Act of 1973 in the allocation of aid among Latin American countries. The result of our analysis is that USAID flows are not influenced significantly by the New Directions policy. Our conclusion echoes the findings of Maizels and Nissanke (1984) *that bilateral aid in general reflects donor interest rather than recipient need* [emphasis added].

CHAPTER IV
STATUS OF AG REE IN LAC USAID MISSION HOST COUNTRIES

A. Introduction

LAC/DR/RD surveyed LAC USAID Missions to determine each Mission's assessment of the status of Ag REE in the Mission's host country. A copy of the survey questionnaire appears in Annex C, while Annex D contains the case studies prepared from the survey responses. This chapter summarizes key survey findings, although the data on which these findings are based are, as with most surveys, somewhat subjective. The survey respondent typically was the Mission's Agriculture and/or Rural Development Officer (ADO), although some ADOs assigned the task to a deputy or office staff members who worked together to complete the questionnaire.

A Mission ADO must make decisions based on his/her views of the problems in the Mission's host country. Such views, as informed or misinformed as they may be in comparison with "hard" data or facts that often simply are not available, do indicate how Mission ADOs assess the status of Ag REE in the country in which the ADO is working. Thus, the data reported here provide a preliminary way to look systematically at variations in the status of Ag REE across the LAC countries and subregions. It is not the intent of the author to provide the final word on the status of Ag REE in the LAC region. The objective is to provide data that may be useful in identifying problems that exist and the potential role AID can play in addressing these problems.

This chapter reviews three topics—progress of Ag REE organizations; adequacy of public sector Ag REE organizations; and constraints to developing public sector Ag REE organizations. More detailed, country-specific survey questionnaire summary tables are presented in Annex E. The following chapter (V) provides a summary of Mission responses describing Mission programs to strengthen Ag REE.

B. Progress of Ag REE Organizations

The survey respondent was asked to assess the progress of each of four types of Ag REE organizations in developing a number of attributes; these attributes (questionnaire items), may be reviewed in the survey questionnaire (Annex C). The four types of organizations considered are: (1) the public sector organization having primary responsibility for agricultural research (PR); (2) the public sector organization having primary responsibility for agricultural extension (PX); (3) agricultural education (AE) organizations; and (4) technology generation and transfer (TG&T) through private organizations (PT). For each type (e.g., public agricultural research organization), several questionnaire items (e.g., developing on-farm research as an integral part of adaptive research) were presented and the respondent was asked to rate the progress made by the organization on each item (e.g., much

progress, some progress, no progress, or host country did not seek to make progress in the area described by the item).

Table 4.1 summarizes the subregional averages of the progress ratings reported by the Missions for the Ag REE organizations in their respective host countries. Based on each subregion's average responses, Table 4.1 reports the average combined percent of progress ratings in the "some" and "much" categories for each organizational type. Data in Table 4.1 derive from the more detailed, country-specific data provided in Table 4.2.

The organizational type rated by the Missions as having made the most progress is that of private TG&T organizations (PT). As noted in Table 4.1, this area's average progress rating was 69%. By comparison, progress of public research organizations (PR) was rated at 55%, while public extension (PX) and agricultural education were rated at 51% and 45%, respectively. In the view of the Mission ADOs, progress in private TG&T (60%) has been greater than in public TG&T (53%, average of PR=55% and PX=51%). Also, the data clearly reflect that there are many areas in which the ADOs feel that public TG&T organizations (i.e., public research and extension) in the LAC region have made no progress.

Table 4.1. LAC Subregional Averages of USAID Mission Ratings of Progress of Ag REE Organizations.

Progress: Based on USAID Mission ratings of "some" and "much" progress with respect to N attributes in each of the following areas:

PR = Public Agricultural Research
PX = Public Agricultural Extension
AE = Agricultural Education
PT = Private TG&T

	Average % Some & Much Progress					
Subregion	PR	PX	AE	PT	Avg.	Rank
Andean	65	46	52	74	59	1
Caribbean	43	53	56	61	53	3
Central American	58	53	26	72	56	2
Average	55	51	45	69	56	
Rank	2	3	4	1		

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Annex C for survey questionnaire listing of each area's N attributes).

Table 4.2. USAID Mission Ratings of Progress of AID-Assisted LAC Countries in Developing Agricultural REE Organizations.

Progress: Based on USAID Mission ratings of "some" and "much" progress with respect to N attributes in each of the following areas:

PR = Public Agricultural Research
PX = Public Agricultural Extension
AE = Agricultural Education
PT = Private TG&T

Subregion/Country	% Some & Much Progress PR	PX	AE	PT	Avg.	Rank	Rank
ANDEAN						**Rank**	
Bolivia	89	38	75	94	74	1	2
Ecuador	28	100	44	67	60	2	5
Perú	78	0	38	61	44	3	9
Average	65	46	52	74	59		
CARIBBEAN						**Rank**	
Dominican Republic	11	0	63	95	42	3	10
Haiti	50	12	6	33	26	4	12
Jamaica	33	100	75	89	74	1	2
RDO/C	78	100	81	28	72	2	4
Average	43	53	56	61	53		
CENTRAL AMERICAN						**Rank**	
Belize	89	100	75	78	85	1	1
Costa Rica	33	0	0	67	50	4	8
El Salvador	33	19	6	61	30	5	11
Guatemala	78	88	31	56	57	3	7
Honduras	56	56	19	100	58	2	6
Average	58	53	26	72	56		
Central America (*)	67	100	69	56	73		
CATIE (*)	100	100	100	n/a	100		

* = As rated by ROCAP

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Annex C for survey questionnaire listing of each area s N attributes).

Looking across the four organizational types, Table 4.1 provides data on the overall progress of Ag REE in each subregion. No subregion was rated as high as 60%, although the Andean region was rated at 59%, followed by Central America (56%) and the Caribbean (53%). The Andean region was rated much higher in public research (PR=65%) than in public extension (PX=46%). The rating given private TG&T (PT=74%) seems high if one views the Central American and Caribbean regions as generally being more advanced in developing nontraditional agricultural export (NTAE) crops. On the other hand, given that the Andean Missions (Bolivia, Ecuador, and Perú) are under pressure to find crop and technology alternatives to coca, this pressure may have operated as an inflation factor, pushing the rating of private TG&T (PT=74%) much higher than this activity's real status.

In the Caribbean, PR and PX received low progress ratings (PR=43%, PX=53%), while private TG&T was rated higher (PT=61%). PR was rated much higher in Central America (PR=58%), although PX received the same rating (PX = 53%) as in the Caribbean. But PT was rated higher in Central America (PT=72%) than in the Caribbean (PT=61%). AE was the lowest rated area, rated highest in the Caribbean (56%), lowest in Central America (26%), and in between in the Andean region (52%).

Looking across the three subregions, there is little variation among the regions with respect to the overall average progress ratings—59% for the Andean region, 56% for the Central American region, and 53% for the Caribbean region, thus making the relative ranks reported in Table 4.1 not significant. On the other hand, as indicated by the data in Table 4.2, when the variation among the country-specific averages are considered, one may observe that there are major differences among countries both within and across subregions. Based on the data, the ranking of countries, in terms of Mission ratings of progress in developing Ag REE systems, is as follows:

Rank	Progress	Country
1	85	Belize
2	74	Bolivia
2	74	Jamaica
4	72	RDO/C
5	60	Ecuador
6	58	Honduras
7	57	Guatemala
8	50	Costa Rica
9	44	Perú
10	42	Dominican Republic
11	30	El Salvador
12	26	Haiti

This ranking is based on the average of each Mission's progress ratings across four Ag REE organizational types (PR, PX, AE, and PT), and summing the percentages for two progress rating categories ("some" and "much"). The ranking assumes an equal weight for both the organizational types and the progress ratings. If the "much" ratings were to be

weighted more than the "some" ratings, and the weighted "some" and "much" ratings were summed into a total country score, a different country ranking might result that may or may not be more consistent with one's perceptions of which AID-assisted countries have progressed the most and least with respect to developing their Ag REE systems. Also, the country rankings likely would differ if based only on one of the individual organizational types (PR, PX, AE, and PT).

More importantly, this is a ranking based on the perceptions of Mission ADOs of the progress of Ag REE systems in their countries. It is an indicator of which countries, as seen by Mission ADOs, have made the most (least) progress, not of which countries have the best or worst Ag REE systems. For example, one could argue that Guatemala's PR system (ICTA) is considerably more developed than the PR system in Belize. On the other hand, given that the PR systems in countries such as Belize or Jamaica are relatively weak, there is a possibility that improvements in the PR system in these countries might be assigned a higher progress rating (e.g., "much" rather than "some") than the same improvement might be assigned in the case of a country like Guatemala. Additional analysis on these possibilities may be made at a later date under the LAC TECH project.

C. Adequacy of Public Agricultural Research and Extension

1. Public Sector Agricultural Research

Table 4.3 summarizes the subregional averages of the adequacy ratings reported by USAID Missions for the public sector organization primarily responsible for agricultural research in their host countries. Based on average responses in each subregion, Table 4.3 reports the average percentages of "poor" and "very poor" ratings in four areas of adequacy—budget (BU), numbers trained (NT), personnel management (PM), and program planning (PP). The data in Table 4.3 are based on the more detailed, country-specific data provided in Table 4.4.

The adequacy type rated by the Missions as being "poorest" in PR organizations is personnel management (PM=85%), followed by program planning (PP=83%), budget (BU=81%), and numbers trained (NT=43%). This indicates that the most severe constraint is personnel management, not the lack of trained personnel. Further, the high percentages reported for program planning (PP=83%) and budget (BU=81%) indicate that, even given availability of adequate numbers of trained personnel, PR systems in AID-assisted LAC countries also suffer from a lack of adequate budget as well as by a lack of adequate program planning systems for using the budget.

Table 4.3. LAC Subregional Averages of USAID Mission Ratings of Adequacy of Public Sector Organization Having Primary Responsibility for Agricultural Research.

Adequacy: Based on USAID Mission ratings of "poor" or "very poor" on N attributes in each of the following areas:

BU = Budget
NT = Numbers Trained
PM = Personnel Management
PP = Program Planning

Average % Poor & Very Poor

Subregion	BU	NT	PM	PP	Avg.	Rank
Andean	100	47	100	100	87	1
Caribbean	61	30	75	75	60	3
Central American	83	52	80	75	72	2
Average	81	43	85	83	73	
Rank	3	4	1	2		

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Annex C for survey questionnaire listing of each area's N attributes).

Table 4.4. Adequacy of Public Sector Agricultural Research Organization in AID-Assisted LAC Countries.

Adequacy: Based on USAID Mission ratings of "poor" or "very poor" on N attributes of adequacy in each of the following areas:

BU = Budget
NT = Numbers Trained
PM = Personnel Management
PP = Program Planning

Subregion/Country	% Poor & Very Poor						
	BU	NT	PM	PP	Avg.		Rank
ANDEAN						**Rank**	
Bolivia	100	80	100	100	95	3	12
Ecuador	100	60	100	100	90	2	9
Perú	100	0	100	100	75	1	4
Average	100	47	100	100	87		
CARIBBEAN						**Rank**	
Dom. Rep.	100	40	100	100	85	3	7
Haiti	43	20	100	100	66	2	3
Jamaica	100	60	100	100	90	4	9
RDO/C	0	0	0	0	0	1	1
Average	61	30	75	75	60		
CENTRAL AMERICAN						**Rank**	
Belize	100	20	100	100	80	2	5
Costa Rica	71	100	100	100	93	5	11
El Salvador	100	40	100	100	85	4	7
Guatemala	57	40	0	0	24	1	2
Honduras	86	60	100	75	80	2	5
Average	83	52	80	75	72		
Central America (*)	71	60	100	75	77		
CATIE (*)	100	100	75	0	69		

* As rated by ROCAP

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Annex C survey questionnaire listing of each area's N attributes).

Table 4.3 also indicates a rough ranking of subregions, with these problems being most severe in the Andean region (87%), followed by Central America (72%) and the Caribbean (60%). These major differences among regions are accentuated further when one compares the country-specific data reported in Table 4.4. Based on these data (Table 4.4), the country ranking, in terms of Mission ratings of adequacy of the primary PR organization, is as follows:

Rank	Adequacy	Country
1	0	RDO/C
2	24	Guatemala
3	66	Haiti
4	75	Perú
5	80	Belize
5	80	Honduras
7	85	Dominican Republic
7	85	El Salvador
9	90	Ecuador
9	90	Jamaica
11	93	Costa Rica
12	95	Bolivia

This ranking is based on the average of each Mission's adequacy ratings across four areas of adequacy (BU, NT, PM, and PP), and summing the "poor" and "very poor" percentages. The ranking assumes an equal weight for these two rating categories. However, if the "very poor" ratings were to be weighted more than the "poor" ratings, and the weighted "poor" and "very poor" ratings were summed into a total score, a different ranking of countries might result that may or may not be more consistent with a reader's individual perceptions of which AID-assisted countries have the most or least adequate public sector agricultural research organizations. Additional analysis on this point may be done under the LAC TECH project.

Despite this precautionary note, it is clear that, with two exceptions (RDO/C and Guatemala) and regardless of subregion, the adequacy of the public sector agricultural research in most AID-assisted LAC countries is "poor" or "very poor." However, as Table 4.4 reports, "inadequacy" is especially severe in the Andean region in all areas (except numbers trained), with the average percentages for budget, personnel management, and program planning consistently reported as 100% ("poor" or "very poor"). This same pattern applies for all Caribbean region countries (except RDO/C) and for much of Central America (see Table 4.4).

2. Public Sector Agricultural Extension

Table 4.5 summarizes the subregional averages of the adequacy ratings reported by USAID Missions for the public sector organization primarily responsible for agricultural extension in their countries. Based on the averages in each subregion, Table 4.5

reports the average percentages of "poor" and "very poor" ratings for four adequacy types—budget (BU), numbers trained (NT), personnel management (PM), and program planning (PP). The data in Table 4.5 are based on the country-specific data provided in Table 4.6.

In the case of PX organizations, two adequacy types tied in the Mission ratings as being "poorest": personnel management (PM) and program planning (PP), both receiving an 85% rating, followed closely by budget at 81%. This is the same pattern reported in the preceding section for the PR organization, with the adequacy of the numbers trained for extension being rated even lower (PX=54%) as compared with PR (43%). Generally, inadequacy of PX organizations is more severe than inadequacy of PR organizations.

Comparing subregions, the ranking of regions reported in Table 4.5 indicates that the inadequacy of public sector agricultural extension is most severe the Andean region (92%), followed by Central America (77%) and the Caribbean (60%). In terms of "adequacy of performance" of the PX organization, the Caribbean is the highest rated area (67% "poor" or "very poor" ratings), while PX is rated much lower in the Andean (78%) and Central American (80%) regions. Excepting RDO/C (received no "poor" or "very poor" performance ratings), all of the countries received at least a 67% poor performance rating for PX, and six countries received a 100% rating (see Table 4.6).

The differences among subregions is accentuated further if one compares the country-specific data (Table 4.6). Based on these data, Mission ratings of adequacy of the PX organization produced the following ranking:

Rank	Adequacy	Country
1	16	RDO/C
2	24	Guatemala
3	40	Jamaica
4	66	Haiti
5	75	Perú
6	85	Dominican Republic
6	85	El Salvador
8	90	Belize
9	92	Honduras
10	93	Costa Rica
11	100	Bolivia
11	100	Ecuador

Table 4.5. LAC Subregional Averages of USAID Mission Ratings of Adequacy of Public Sector Organization Having Primary Responsibility for Agricultural Extension.

Adequacy: Based on USAID Mission ratings of "poor" or "very poor" on N attributes in each of the following areas:

BU = Budget
NT = Numbers Trained
PM = Personnel Management
PP = Program Planning
AP = Adequacy of Performance

	Average % of Poor & Very Poor						
Subregion	BU	NT	PM	PP	Avg.	Rank	AP
Andean	100	67	100	100	92	1	78
Caribbean	61	30	75	75	60	3	67
Central Am.	83	64	80	80	77	2	80
Average	81	54	85	85	76	75	
Rank	3	4	1	1			

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Annex C survey questionnaire for listing of each area's N attributes).

Table 4.6. Adequacy of Public Sector Agricultural Extension Organizations in AID-Assisted LAC Countries.

Adequacy: Based on USAID Mission ratings of "poor" or "very poor" on N attributes in each of the following areas:

BU = Budget
NT = Numbers Trained
PM = Personnel Management Systems
PP = Program Planning Systems
AP = Adequacy of Performance

Subregion/Country	% Poor & Very Poor BU	NT	PM	PP	Avg.	Rank	Rank	AP
ANDEAN						**Rank**		
Bolivia	100	100	100	100	100	2	11	67
Ecuador	100	100	100	100	100	2	11	67
Perú	100	0	100	100	75	1	5	100
Average	100	67	100	100	92			78
CARIBBEAN						**Rank**		
Dominican Republic	100	40	100	100	85	4	6	100
Haiti	43	20	100	100	66	3	4	67
Jamaica	67	20	50	75	40	2	3	100
RDO/C	0	40	25	0	16	1	1	0
Average	61	30	75	75	60			67
CENTRAL AMERICAN						**Rank**		
Belize	100	60	100	100	90	3	8	67
Costa Rica	71	100	100	100	93	5	10	67
El Salvador	100	40	100	100	85	2	6	100
Guatemala	57	40	0	0	24	1	2	100
Honduras	86	80	100	100	92	4	9	67
Average	83	64	80	80	77			80
Central America (*)	100	100	100	100	100			100
CATIE (not rated)	-	-	-	-	-			-

* = As rated by ROCAP

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Annex C survey questionnaire for listing of each area's N attributes).

It is emphasized that this ranking procedure is based on the average of each Mission's adequacy ratings across four adequacy types (BU, NT, PM, and PP), and summing percentages for the "poor" and "very poor" adequacy categories. The ranking assumes an equal weight for each of the four adequacy types and both of the two adequacy rating categories. However, if the "very poor" ratings were weighted more than the "poor" ratings, and weighted "poor" and "very poor" ratings were summed into a total score for each country, a different country ranking would emerge that may or may not be more consistent with a reader's individual perceptions of which AID-assisted countries have the most or least adequate public sector agricultural research organizations. Additional analysis on this point may be done under the LAC TECH project.

With the exception of RDO/C and regardless of subregion, the USAID Missions rated the adequacy and performance of public agricultural extension in all AID-assisted LAC countries as "poor" to "very poor." However, as Table 4.5 reports, "inadequacy" is particularly severe in the Andean region in all areas (except numbers trained in Perú), with average percentages for budget, personnel management, and program planning also being high in several countries of the Caribbean (D.R. and Haiti) and Central America (Belize, Costa Rica, El Salvador, and Honduras).

D. Constraints to Strengthening Public Sector Ag REE

This section reviews Mission ratings of two types of constraints to strengthening public sector Ag REE: (1) constraints internal to public sector and (2) constraints internal to USAID Mission. Note that USAID/Jamaica, in rating constraints, provided separate ratings for research, extension, and education. An annex to the USAID/ Jamaica case study (see Annex D) describes the procedures followed to convert these separate ratings for research, extension, and education into a combined rating, in order to allow comparison of USAID/Jamaica's ratings to those provided by the other USAID Missions.

1. Constraints Internal to Public Sector

Table 4.7 summarizes Mission ratings of constraints, internal to public sector organizations, to strengthening public sector Ag REE. Overall, Missions identified a "weak public sector" (2.72) as the number one constraint, followed by "government not willing to fund agricultural REE" (2.64). Both constraints averaged higher than a 2.5 rating, the midpoint between "somewhat a constraint" (2.0) and "major constraint" (3.0). These two constraints were followed in order by "government not see benefit of investing in agricultural REE" (2.42), "lack human resources" and "small country size" (tied at 2.39), and "lack of technology demand" (2.10). Looking across the subregions, constraints internal to public sector organizations were rated as being most severe in the Caribbean (2.52), followed closely by the Central American (2.48) and Andean (2.39) regions.

Table 4.7. LAC Subregional Averages of USAID Mission Ratings of Constraints (to Improving Ag REE) Internal to Public Sector Organizations.

Key: 3 = Major Constraint; 2 = Somewhat a Constraint

Constraint[1]	Andean	Caribbean	Cen.Am.	Avg.	Rank
Small Country Size	2.0	2.67	2.5	2.39	4
Weak Public Sector	2.67	3.0	2.5	2.72	1
Govt. Not Willing to Fund REE	2.67	3.0	2.25	2.64	2
Lack Human Resources	2.5	2.0	2.67	2.39	4
Govt. Not See Benefit of Investing in REE	2.5	2.25	2.5	2.42	3
Lack of Technology Demand	2.0	2.20	-	2.10	5
Average	2.39	2.52	2.48	2.44	
Rank	3	1	2		

[1]Averages based on sum of item ratings in a row or column, divided by total number of items in row or column rated by Mission as "major constraint" (3) or "somewhat a constraint" (2).

In the Caribbean region, the two factors rated highest as constraints were "weak public sector" and "government not willing to fund agricultural REE." The only other factor rated higher than 2.5 was that of "small country size" (2.67), indicating the difficult problem that many small Caribbean island countries face in trying to find ways to support public agricultural research.

In the case of Central America, four of five constraints were rated at 2.5 or higher, three receiving a 2.5 rating ("small country size," "weak public sector," and "government not see benefit of investing in agricultural REE"). The highest rated constraint was "lack human resources," pointing to the need in the Central American region for increased emphasis on agricultural education.

In the Andean region, four of six constraints were rated at 2.5 or higher, two receiving a 2.5 rating ("lack of human resources" and "government not see benefit of investing in agricultural REE"). The two highest rated constraints (at 2.67) were "weak public sector" and "government not willing to fund agricultural REE."

2. Constraints Internal to USAID Mission

Table 4.8 summarizes Mission ratings of constraints, internal to a USAID Country Mission, to strengthening public sector Ag REE. Overall, two factors were identified as rating a constraint level higher than 2.5: "Mission lacks an agricultural REE coordination strategy" (2.75) and "Mission lacks adequate staff to deal with agricultural REE" (2.67). Other constraints, in order of importance, were: "push toward natural resources" (2.50), "export-led development strategy" (2.33), "private sector emphasis" (2.19), "Mission sees REE separately" (2.17), and "push toward short-term projects" (2.13).

Comparing subregions, factors "internal to a USAID Country Mission" were rated as constraints by the Missions in the following subregional rank order: (1) Central American (2.46); (2) Caribbean (2.39); and (3) Andean (2.20). In the Central American region, factors rated highest as constraints internal to the USAID Country Mission were "export-led development strategy" and "push toward natural resources" (both rated at 3.0), followed by "Mission lacks agricultural REE coordination strategy" (2.5). In the Andean and Caribbean regions, the highest rated constraint was "Mission lacks adequate staff to deal with agricultural REE" (3.0), while this constraint was tied in the Caribbean region with another constraint—"Mission lacks agricultural REE coordination strategy."

Table 4.8. LAC Subregional Averages of USAID Mission Ratings of Constraints (to Improving Ag REE) Internal to USAID/Country Mission.

Key: 3 = Major Constraint; 2 = Somewhat a Constraint

Constraint[1]	Andean	Caribbean	Cen.Am.	Avg.	Rank
Push toward Short-Term Projects	2	2.0	2.4	2.13	7
Private Sector Emphasis	2	2.25	2.33	2.19	5
Export-Led Development Strategy	2	2.0	3.0	2.33	4
Push toward Natural Resources	-	2.0	3.0	2.50	3
Mission Sees REE Separately	2	2.5	2.0	2.17	6
Mission Lacks REE Coordination Strategy	-	3.0	2.5	2.75	1
Mission Lacks Adequate Staff to Deal w/ REE	3	3.0	2.0	2.67	2
Average	2.20	2.39	2.46	2.39	
Rank	3	2	1		

[1]Averages based on sum of item ratings in a row or column, divided by total number of items in row or column rated by Mission as "major constraint" (3) or "somewhat a constraint" (2).

E. Summary of Status of Ag REE Systems in the LAC Region

1. Progress of Ag REE Systems

On average, Mission ADOs in AID-assisted LAC countries rated the progress of Ag REE systems in these countries as being no higher than 56%. The only Ag REE system component rated higher than 50%, on average, was private TG&T (PT=69%). Generally, public sector agricultural research and extension were rated much lower (PR=55%, PX=53%); and agricultural education received, on average, a rating of only 45%. These measures suggest that USAID ADOs give relatively high marks to the progress made in the area of agricultural TG&T by private organizations, and relatively low marks to public sector agricultural research and extension. The marks are even lower for agricultural education, although USAID/ Honduras gave high ratings to private agricultural education, referring to the Pan American Agricultural School. Similarly, ROCAP and RDO/C gave relatively high ratings to regional higher agricultural education centers (CATIE and UWI).

2. Adequacy of Public Ag REE Organizations

With respect to the adequacy of public sector agricultural research and extension, the ADOs rated most attributes of adequacy as being "poor" or "very poor." This was particularly the case with the areas of personnel management, program planning, and budget, each of which had an "inadequacy" rating in excess of 80%. The "inadequacy" rating for numbers trained was much lower, being 54% for public sector agricultural extension and only 43% for public sector agricultural research. Comparing subregions, the inadequacies are the greatest in the Andean region, followed by Central America and the Caribbean.

The relative degrees of inadequacy may be seen by looking at the country-specific data presented in Table 4.9. This table averages the adequacy ratings (% "poor" and "very poor") earlier reported for public agricultural research and extension.

3. Constraints to Public Ag Research and Extension

a. Internal to Public Sector

Overall, Missions identified a "weak public sector" (2.72) as the number one constraint, followed by "government not willing to fund agricultural REE" (2.64). Both constraints averaged higher than a 2.5 rating, the midpoint between "somewhat a constraint" (2.0) and "major constraint" (3.0). These factors were followed by "government not see benefit of investing in agricultural REE" (2.42), "lack human resources" and "small country size" (tied at 2.39), and "lack of technology demand" (2.10).

Table 4.9. Rank Order of Severity of Adequacy of Public Agricultural Research and Extension Systems in AID-Assisted LAC Countries.

	% Poor & Very Poor				
	Research	Extension			
Country	Adequacy	Adequacy	Avg.	Rank	Subregion
Bolivia	95	100	98	1	Andean
Ecuador	90	100	95	2	Andean
Costa Rica	93	93	93	3	Central America
Honduras	80	92	86	4	Central America
Belize	80	90	85	5	Central America
Dom. Rep.	85	85	85	5	Caribbean
El Salvador	85	85	85	5	Central America
Perú	75	75	75	8	Andean
Haiti	66	66	66	9	Caribbean
Jamaica	90	40	65	10	Caribbean
Guatemala	24	24	24	11	Central America
RDO/C	0	16	8	12	Caribbean

Source: Tables 4.4 and 4.6

Looking across subregions, constraints internal to public sector organizations were rated as being most severe in the Caribbean (2.52), followed closely by the Central American (2.48) and Andean (2.39) regions.

In the Caribbean region, the two factors rated highest as constraints were "weak public sector" and "government not willing to fund agricultural REE." The only other factor rated higher than 2.5 was that of "small country size" (2.67), indicating the difficult problem that many small Caribbean island countries face in trying to find ways to support public agricultural research.

In the case of Central America, four of five constraints were rated at 2.5 or higher, three receiving a 2.5 rating ("small country size," "weak public sector," and "government not see benefit of investing in agricultural REE"). The highest rated constraint was "lack human resources," pointing to the need in the Central American region for increased emphasis on agricultural education.

In the Andean region, four of six constraints were rated at 2.5 or higher, two receiving a 2.5 rating ("lack of human resources" and ""government not see benefit of investing in agricultural REE"). The two highest rated constraints (at 2.67) were "weak public sector" and "government not willing to fund agricultural REE."

b. Internal to USAID Mission

Overall, two factors were identified as rating a constraint level higher than 2.5—"Mission lacks an agricultural REE coordination strategy" (2.75) and "Mission lacks adequate staff to deal with agricultural REE" (2.67). Other constraints, in order of importance, were "push toward natural resources" (2.50), "export-led development strategy" (2.33), "private sector emphasis" (2.19), "Mission sees REE separately" (2.17), and "push toward short-term projects" (2.13).

Comparing subregions, factors "internal to a USAID Country Mission" were rated as being constraints by the Missions in the following subregional rank order: (1) Central American (2.46); (2) Caribbean (2.39); and (3) Andean (2.20). In the Central American region, factors rated highest as constraints internal to the USAID Country Mission were "export-led development strategy" and "push toward natural resources" (both rated at 3.0), followed by "Mission lacks agricultural REE coordination strategy" (2.5). In the Andean and Caribbean regions, the highest rated constraint was "Mission lacks adequate staff to deal with agricultural REE" (3.0), although this constraint was tied in the Caribbean region with another constraint—"Mission lacks agricultural REE coordination strategy"—that also had a 3.0 rating.

c. Public Sector & USAID Mission Constraints Compared

Table 4.10 summarizes the USAID Mission constraint ratings reviewed in the two preceding sections. This was done by summing the "major constraint" (3) or "somewhat a constraint" (2) rating for each factor, thereby producing a rating for each factor in each category. Adding together each country's two summed ratings resulted in a total rating for each country, making it possible to rank the countries with respect to the relative magnitude of constraints to strengthening Ag REE, as follows:

Rank	Rating	Country
1	27	Haiti
2	26	Jamaica
3	25	Bolivia
4	22	Guatemala
4	22	Honduras
6	20	El Salvador
7	16	Dominican Republic
8	14	Ecuador
9	11	RDO/C
9	11	Belize
11	9	Perú
12	8	Costa Rica

Table 4.10. Summation of USAID Mission Ratings of Constraints to Improving Ag REE in Public Sector Organizations.

Subregion/Country	Constraints Internal To				
	Public Sector Organization	USAID Mission	Total		Rank
Attributes (N)	6	7	13		
Possible Range	12-18	14-21	26-39		
ANDEAN				**Rank**	
Bolivia	14	11	25	1	3
Ecuador	12	2	14	2	8
Perú	6	3	9	3	11
CARIBBEAN				**Rank**	
Dominican Republic	9	7	16	3	7
Haiti	13	14	27	1	1
Jamaica	14	12	26	2	2
RDO/C	7	4	11	4	9
CENTRAL AMERICAN				**Rank**	
Belize	9	2	11	4	9
Costa Rica	5	3	8	5	12
El Salvador	11	9	20	3	6
Guatemala	5	17	22	1	4
Honduras	12	10	22	1	4
Central America (*)	8	12	20		
CATIE (*)	12	11	23		

* = As rated by ROCAP

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Annex C survey questionnaire for listing of each area's N attributes).

This ranking is based on each Mission's reported constraint ratings, assuming no difference in the relative importance of the two major categories (factors internal to public sector compared with factors internal to USAID Mission). The ranking assumes an equal weight for each factor. If the "major constraint" rating were to be weighted more heavily (e.g., 4) relative to the "somewhat a constraint" weight (at 2), and these alternate weights were used to calculate a total score for each country, or public sector factors were weighted more heavily than USAID Mission factors, a different country ranking might result that may or may not be more consistent with one's perceptions of which AID-assisted LAC countries face the biggest constraints to strengthening public sector Ag REE organizations.

Finally, Table 4.11, combining Mission ratings across countries and subregions, provides an overall ranking of the relative importance of public sector and USAID Mission constraints, as presented in Table 4.12. The ranking presented in Table 4.12 indicates several patterns. First, the ranking suggests that, as perceived by LAC USAID Missions, the three biggest constraints to Ag REE-strengthening are client country factors—"weak public sector," "government not willing to fund agricultural REE," and "government not see benefit of investing in agricultural REE." This suggests that the Missions see the host country or its government as the locus of the three biggest constraints to strengthening Ag REE.

Second, the ranking suggests that, as perceived by the LAC USAID Missions, the next three constraints, except "lack human resources" which tied with "push toward short-term projects," are factors internal to AID development strategy: "private sector emphasis," "push toward short-term projects," and "export-led development strategy". Each factor reflects the current emphasis in Agency development strategy on working with the private sector to develop nontraditional agricultural exports and a declining emphasis on long-term projects aimed at developing public sector capacity to respond to traditional agricultural production and rural development problems.

Third, the ranking suggests that, as perceived by the LAC USAID Missions, the ability of Missions to respond to the need to strengthen Ag REE is constrained not only by policy directives from AID/W (i.e., "private sector emphasis") but also by a lack of adequacy within the Missions to address Ag REE problems. This inadequacy is reflected by the set of constraints falling in the third group in Table 4.12: "Mission lacks adequate staff to deal with agricultural REE," "Mission sees agricultural REE separately," and "Mission lacks agricultural REE coordination strategy."

Finally, reviewing the three lowest rated factors, the Missions do not see "small country size" or the Agency's recent "push toward natural resources" as necessarily being constraints to Ag REE-strengthening. But it is interesting that the Missions do not see "lack of technology demand" as a constraint. But this is consistent with a widely held view that the obstacle to increased agricultural production is not a lack of demand for improved agricultural technology but rather a lack of supply of such technology.

Table 4.11. Relative Importance of Constraints to Improving Ag REE in Public Sector Organizations in AID-Assisted LAC Countries.

KEY: Based on those attributes rated by USAID Missions as being a "major constraint" (3) or "somewhat a constraint" (2). Ratings for each attribute were summed across Missions in each subregion. The complete set of constraint statements rated by each USAID Mission appear in the survey questionnaire (see Annex C).

	Summated Mission Ratings by Subregions					
Potential Constraints	Andean	Caribbean	Central American	Total		Overall Rank
Internal to Public Sector					**Rank**	
Small Country Size	2	5	3	10	5	11
Weak Public Sector	8	9	10	27	1	1
Govt. Not Willing Fund REE	8	9	9	26	2	2
Lack Human Resources	5	4	8	17	4	5
Govt. Not See Benefit of Invest in REE	5	9	10	24	3	3
Lack of Technology Demand	4	4	-	8	6	12
Internal to USAID Mission					**Rank**	
Push toward Short-Term Projects	2	4	12	18	2	5
Private Sector Emphasis	4	9	7	20	1	4
Export-Led Development Strategy	2	8	6	16	3	7
Push toward Natural Resources	-	2	3	5	7	13
Mission Sees REE Separately	2	5	4	11	5	9
Mission Lacks REE Coordination Strategy	-	6	5	11	5	9
Mission Lacks Adequate Staff to Deal w/ REE	6	3	4	13	4	8

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990.

Table 4.12. **Rank Order of Constraints to Strengthening Public Agricultural Research and Extension in AID-Assisted LAC Countries.**

Total	Rank	Constraints to Strengthening Public Sector Agricultural REE	Internal To
27	1	Weak public sector	Public Sector
26	2	Government not willing to fund Ag REE	Public Sector
24	3	Government not see benefit of investing in Ag REE	Public Sector
20	4	Private sector emphasis	USAID Mission
17	5	Lack human resources	Public Sector
18	6	Push toward short-term projects	USAID Mission
16	7	Export-led development strategy	USAID Mission
13	8	Mission lacks adequate staff to deal with Ag REE	USAID Mission
11	9	Mission sees Ag REE separately	USAID Mission
11	9	Mission lacks Ag REE coordination strategy	USAID Mission
10	11	Small country size	Public Sector
8	12	Lack of technology demand	Public Sector
5	13	Push toward natural resources	USAID Mission

Source: Table 4.11

Table 4.13.

Comparison of Rank Order of Adequacy of Public Agricultural Research and Extension (PARE) Systems and Magnitude of Constraints to Strengthening PARE Systems in AID-Assisted LAC Countries.

	Adequacy		Constraints	
Country	Average[1]	Rank	Rating[2]	Rank
Bolivia	98	1	25	3
Ecuador	95	2	14	8
Costa Rica	93	3	8	12
Honduras	86	4	22	4
Belize	85	5	11	9
Dom. Rep.	85	5	16	7
El Salvador	85	5	20	6
Perú	75	8	9	11
Haiti	66	9	27	1
Jamaica	65	10	26	2
Guatemala	24	11	2	4
RDO/C	8	12	11	9

Source: Tables 4.9 and 4.10

[1]Average percentage of items rated as "poor" and "very poor." The higher this percentage, the less adequate or (more inadequate) is the public agricultural research and extension (PARE) system.

[2]Sum of ratings of 3 ("major constraint") and 2 ("somewhat a constraint"). The higher this rating, the greater the number and severity of the constraints that must be overcome in order to strengthen the public agricultural research and extension (PARE) system.

CHAPTER V
AG REE-STRENGTHENING IN LAC USAID MISSION PROGRAMS

This chapter summarizes the survey responses of each LAC USAID Mission with respect to each Mission's strategy, program, and plans regarding Ag REE-strengthening. Specifically, the chapter reviews each Mission's assessment of funding trends for Ag REE-strengthening; provides a summary description of current Mission projects having an Ag REE component; indicates whether the Mission Agriculture and Rural Development Office (ARDO) has a program-level monitoring and evaluation system; summarizes the Mission' strategy, if any, for Ag REE-strengthening; identifies key management questions of concern to the Mission with respect to Ag REE-strengthening; summarizes the Mission's position, if any, on non-project assistance for Ag REE-strengthening; and notes Mission-identified opportunities for Ag REE-strengthening that should be pursued by the Mission or other donors.

A. Trends in Funding for Ag REE-Strengthening

As part of the survey questionnaire, Missions were asked to describe Mission funding trends with respect to Ag REE during the 1980s. Missions could reply that their funding for Ag REE during the 1980s had increased, decreased, been terminated, or that the Mission did not allocate funding for this area. Table 5.1 summarizes Mission responses to the question. Generally, there were only a few instances of the latter two responses. Specifically, Mission funding for public agricultural research (PR) and extension (PX) was terminated in Haiti (Congressional restrictions on providing funding to the GOH) and Costa Rica (low priority on PR and PX by the GOCR and Mission). Further, funding for PR was decreased in Ecuador and the Dominican Republic; funding for PX was decreased in the Dominican Republic, while no funding was allocated for PX in Ecuador.

By comparison, nine Missions reported increased funding for PR and PX. For private TG&T (PT), 12 Missions reported increased funding, the exception being RDO/C. Four Missions reported that no funding had been allocated for agricultural education (AE): Haiti, Costa Rica, El Salvador, and Guatemala. One may note that for Belize, where USAID/Belize only began operations in 1983, Mission funding to each of the four areas necessarily implies an increase in funding. But the Mission indicated that it would be more accurate to say that the Mission allocated some funding to PR, PX, and PT, and little funding to AE. This chapter reviews each Mission's stated rationale for its pattern of funding for strengthening Ag REE.

Table 5.1. USAID Mission Funding Trends for Ag REE in AID-Assisted LAC Countries during the 1980s.

Key: I = Increased
D = Decreased
T = Terminated
N = Did Not Allocate

REGION/ Country	Public Research (PR)	Public Extension (PX)	Agricultural Education (AE)	Private TG&T (PT)
ANDEAN				
Bolivia	I	I	I	I
Ecuador	D	N	I	I
Perú	I	I	I	I
CARIBBEAN				
Haiti	T	T	N	
Dom. Rep.	D	D	I	I
Jamaica	I	I	I	I
RDO/C	I	I	I	D
CENTRAL AMERICAN				
Belize (*)	I	I	I	
Costa Rica	T	T	N	I
El Salvador	I	I	N	I
Guatemala	I	I	N	I
Honduras	I	I	I	I
ROCAP	I	I	I	I
Frequency				
Increased	9	9	9	12
Decreased	2	1	-	1
Terminated	2	2	-	-
Did Not Allocate	-	1	4	-

* = Allocated some for PR, PX, and PT, but very little for AE.

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990.

1. Andean Region

Bolivia: Mission funding for PR and PX, provided to IBTA, increased during the 1980s to support developing alternative crops for the Chapare and High Valleys of Cochabamba. There was a small increase in funding for agricultural education as part of the Mission's DA support for participant training programs. For example, the Andean Scholarship Program includes six agricultural slots per year. The PL-480 Title III local currency program has provided funding to set up pilot farms (e.g., model dairy farms), and to support agricultural student research programs in the University of Santa Cruz and a country-wide scholarship program for campesinos. This program has included short courses and assistance for completing vocational agricultural degrees in a wide range of subjects including agriculture. The Mission also has increased funding for private sector TG&T (PT) carried out through private sector cooperatives and producer organizations (e.g., funding for private sector research stations). This increase in funding for PT has been influenced both by the difficulty of working with and through the public sector agricultural research and extension system as well as by AID's increased private sector emphasis in recent years.

Ecuador: Mission funding for Ag REE increased in two areas: AE and PT. The Mission indicated that it increased funding for AE because a lack of trained manpower in agriculture is a significant constraint to development of the agriculture sector. The Mission provided support for training of Ecuadoreans at the Pan American Agricultural School at Zamorano and to strengthen teaching at several agricultural schools in Ecuador.

The increment in funding for PT followed from the Mission's disenchantment with public Ag REE. The Mission "believed that private producer organizations, given their interest in gaining access to more productive technologies, would be more effective in carrying out technology generation and transfer than the public sector." However, the Mission indicated that its "thinking has evolved...to consider that both the public and private sector must be involved and actively collaborating with each other if maximum results are to be achieved."

With respect to technology generation in PR organizations, project funding was reduced during the 1980s. The Mission indicated that: "There was no evidence of commitment on the part of the GOE to public agricultural research. In real terms, the budget declined over the period, and nearly all of INIAP's highly trained research personnel resigned to seek more rewarding employment elsewhere." The Mission did not allocate any funding for PX organizations because there was "no viable public agricultural extension organization with which to work."

Perú: Mission funding for Ag REE increased in all four categories--PR, PX, AE, and PT. While the AREE project's success prompted continued support for including PR as a component of the ATT project, various factors (see Chapter III) led the Mission to reorient the ATT project to support an increased emphasis on private TG&T through FUNDEAGO. Mission support for PT was prompted by a growing recognition that private organizations have been "the avant garde for progress." While PX had declined during the military government, the change in leadership on return to a democratically elected government

encouraged the Mission to promote extension. But "political intervention dealt a death blow to extension." Support for AE was motivated by the belief that the good reputation once enjoyed by the National Agrarian University (UNA) could be reestablished.

2. Caribbean Region

Haiti: Mission funding for assistance to the government was terminated because of a Congressional Mandate, thereby also cutting funding for PR and PX. Funding was not allocated to AE since this area was "not part of the overall strategy and focus" of the Mission's assistance program. But the Mission increased funding for PT: "past experience and current evidence suggest that agricultural development programs [are] most likely to have [a] positive impact when channeled through PVO and NGO networks."

Dominican Republic: Mission funding for PR and PX was reduced, reflecting the Mission's description of public sector agricultural research and extension organizations as "incapable, nonviable, underfunded, overstaffed, [and subject to] constant turnover." On the other hand, funding was increased for AE organizations in order "to meet changing demand for technicians, not academics or MBAs." Funding for private agricultural TG&T also increased as the "only viable alternative."

Jamaica: All areas—PR, PX, AE, and PT—experienced funding increases. The Mission noted that PR needed to be strengthened because it had steadily declined since the late 1970s. The Mission provided funding for PX during the 1980s because IMF-mandated cutbacks in 1984-85 had severely affected the extension service. Mission funding for AE followed from the GOJ having closed the only agricultural tertiary institution; this resulted in a need for a continuing education facility specifically for agriculture. With respect to PT, the Mission provided the following rationale for its increased investment in this area: (1) efforts to strengthen [the] public sector had been largely unsuccessful; (2) more emphasis is needed on [technology] transfer rather than generation; and (3) few projects have been implemented in the public sector.

RDO/C: With respect to PT, the Mission did not allocate any project funding during the 1980s; according to the Mission, "the few private organizations which exist in the region for this purpose have adequate funding." On the other hand, the Mission increased funding during the 1980s for PR, PX, and AE, the rationale for these funding increases being stated as follows:

> PR: "The Mission strongly supports technology generation as a means to increase productivity and incomes of farmers in the region. The regional public sector organization [CARDI] was showing some success but required additional strengthening."
>
> PX: "The Mission recognized that technology generated needed assistance to reach most farmers. The Mission also recognized that national extension services required strengthening if they were to play a significant role in the transfer process."

AE: "The Mission believes that educational institutions in the region play a critical role in backstopping extension and research. Therefore, we are providing funds to help these institutions upgrade and maintain the capabilities of extensionists and researchers."

3. Central American Region

Belize: Because USAID/Belize began operations only in January 1983, it was not possible for the Mission to assess a trend in funding in the 1980s, indicating that it did allocate some funding for all four areas, except that only "very little" funding was allocated to AE, since it is not a Mission priority. Given limited funding, some Mission support has been provided to the Belize Institute of Management and other institutions to strengthen these institutions' capability to offer training in management and technical skills essential for an expanding private sector. Generally, the country does not have a strong public agricultural research and extension system; accordingly, the Mission's programs have had a heavy private sector emphasis.

Costa Rica: The Mission terminated project funding to support PR and PX organizations. The Mission's rationale for such termination was that the MOA "is highly politicized, oriented towards maintenance of subsidized production, and failed the [Regional Inspector General] pre-award accounting audit." Also, no project funding was allocated for improving AE, the rationale for this being that AE is "not considered a priority, either in [the] Mission or in AID/W." But the Mission increased project funding to improve PT. The Mission's rationale was to fill "the public sector vacuum with private sector solutions."

El Salvador: Mission funding for Ag REE increased in three areas—PR, PX, and PT; no Mission funding was allocated for AE. But the Mission indicated that the increment in funding for public research/extension was only "slight." The Mission is now placing increased emphasis on private TG&T (e.g., through FUSADES/DIVAGRO's program of adaptive research on nontraditional agricultural export crops). Also, the Mission is working with another private sector foundation (FEPADE) to develop a strategy for privatizing the public sector National Agricultural School (ENA). The Mission also has considered a proposal for creating a private agricultural research foundation and is currently assessing the potential of development assistance for the public sector agricultural research organization (CENTA).

Guatemala: Mission funding for Ag REE increased in three areas—PR, PX, and PT. Under Highlands Agricultural Development and the earlier Agricultural Diversification project, project funding was allocated to strengthen PR (through ICTA) and PX (DIGESA). Agri-Business Development allocated resources for private research for nontraditional agricultural crops. Additional resources were allocated to explore establishing a private foundation for agricultural research. Also, a proposal has been submitted to fund a private extension system. No Mission funding was allocated for AE.

Honduras: Mission funding for Ag REE increased in PX and PT. In the area of PX, the Mission sought to expand the number of rural extension agencies located throughout

the country, in order to improve communication methodologies to facilitate technology transfer, and to provide greater access to information for small farmers. This support was provided through several projects, including Land Use Productivity Enhancement and other projects that are no longer operational.

In PT, Mission projects (Export Development and Services and Honduran Agricultural Research Foundation) provide support for private, nonprofit organizations to expand and improve marketing and research capabilities for nontraditional agricultural export crops, and enable organizations such as FPX and FHIA to be more responsive to the marketing and technological needs of farmers producing for export.

Some Mission funding was allocated to support PR under the Honduran Agricultural Research (522-0139) project, since terminated. The project sought to alleviate technological constraints affecting traditional and agrarian reform farmers, by expanding and strengthening ongoing multidisciplinary research in more regions of the country, and disseminating research results to small-scale farmers. Also, the Mission funded activities to assist public sector higher AE. But the Mission no longer funds activities in this area "nor would consider [funding such activities] under present conditions."

ROCAP: Mission funding for Ag REE increased in all four categories—PR, PX, AE, and PT. Funding for improvement of PR and PX increased as a result of new projects in agricultural technology transfer and coffee and cacao research on a regional basis, as well as projects in tree crop production, watershed management, integrated pest management, and environmental and natural resources management. However, this funding was for a regional agricultural research and education center (CATIE), not for a national-level public sector Ag REE organization.

Increased funding to improve PT was reflected in the Mission's efforts to encourage organization of private sector coffee and cacao producer associations. The Regional Agricultural Technology Networks (PROCACAO) (596-0127) project provided funding to assist the Pan American Development Foundation and Hershey Hummingbird to work with cacao producer associations. Funding also was provided to improve AE through the Regional Agricultural Higher Education project. The Regional Coffee Pest Control and Regional Agricultural Technology Networks projects cooperated with technical departments in existing universities.

B. Current Mission Projects Having Ag REE Components

1. Andean Region

Bolivia: Two projects have components aimed at improving Ag REE. The Chapare Regional Development Project (511-0543) provides some support for strengthening public agricultural research and extension (PR and PX), agricultural TG&T by private organizations (PT), and agricultural education (AE). The project is being implemented by public (IBTA) and private (PVOs) agencies, with technical assistance from Experience, Inc. and Development Alternatives, Inc. Private Agricultural Producer Organizations (511-0589)

provides some support for private TG&T; the project is being implemented by private organizations, with technical assistance from Ronco Consulting Corporation. The Ag REE components of these two projects primarily provide support for project implementation rather than for any traditional "institution building" objective.

The Mission rated the Chapare Regional Development Project as having made some progress in each of the areas—PR, PX, AE, and PT. The Mission indicated that Private Agricultural Producer Organizations has made some progress with respect to PT.

Ecuador: Several current projects have components to improve Ag REE. Rural Technology Transfer Systems (518-0032) provides support for public and private TG&T, while Forestry Sector Development (518-0023) supports public TG&T vis-à-vis forestry problems. Agricultural Research, Extension & Education (518-0068) supports public and private TG&T as well as AE. Agricultural Education (518-0062) supports private AE, while Sustainable Uses for Biological Resources (518-0069), now being designed, will support public and private TG&T initiatives.

The Mission rated Agricultural Education (518-0068) as having made "much" progress in improving AE, while the balance of the Mission's projects impacting on Ag REE were rated as having made "some" progress in improving agricultural TG&T.

Perú: The Mission identified only one project, Agricultural Technology Transfer (ATT) (527-0282) as having an Ag REE component. The project is being implemented by a mix of public and private organizations—the National Institute for Agricultural and Agro-Industrial Research (INIAA), National Agrarian University (UNA), National Agrarian Organization, and Fundación para el Desarrollo Agropecuario (FUNDEAGRO). Technical assistance is being provided by North Carolina State University.

The Mission rated the ATT project (598-0282) as having made "some" progress in PR, PT, and AE. But the project was rated as having made "no" progress with respect to PX.

2. Caribbean Region

Dominican Republic: Several current projects have components aimed at improving Ag REE. On-Farm Water Management (517-0159) and Agricultural Policy Analysis (517-0156) provide support for PR, while On-Farm Water Management provides support for PX. University Agribusiness Partnership (517-0243) and Agricultural Sector Training (517-0160) provide support for AE. Also, University Agribusiness Partnership, Commercial Farming Systems (517-0214), and Agribusiness Promotion (517-0186) support for PT.

The following projects are being implemented through public organizations: Agricultural Policy Analysis (National Agricultural Council), On-Farm Water Management (National Institute of Hydraulic Resources), and Agricultural Sector Training (National Office of Planning). Agribusiness Promotion is implemented by the private Joint

Agricultural Coinvestment Council (JACC). A combination of public/private implementation is being followed in the University Agribusiness Partnership [Superior Institute of Agriculture (ISA)] and Commercial Farming Systems (Central Bank and the Agricultural Development Foundation) projects.

With respect to AE, the Mission rated Agricultural Sector Training as having achieved "much" progress. Similarly, "much" progress in PT was achieved by the Agribusiness Promotion project, while "some" progress was achieved in this same area by the Commercial Farming Systems project. On-Farm Water Management and Agricultural Policy Analysis were rated as having made "some" progress vis-à-vis PR, while On-Farm Water Management also was rated as having made "some" progress with respect to PX.

Haiti: USAID/Haiti identified three projects as having Ag REE components. Target Watershed Management (521-0191), implemented by the Associates in Rural Development (ARD), University of Florida, and local NGOs; Agroforestry Program (521-0217), implemented by the Pan American Development Foundation (PADF), CARE, and SECID (Auburn University); and Coffee Revitalization (521-0216), implemented by the Inter-American Institute for Cooperation on Agriculture (IICA). All projects are being implemented by private sector organizations.

The Mission rated Agroforestry Program (521-0217) as having made "much" progress and Target Watershed Management (521-0191) as having made "some" progress in improving TG&T through private organizations. The Mission noted that it is too early to assess progress on Coffee Revitalization (521-0216).

Jamaica: Several current projects have components aimed at improving Ag REE. Jamaica Agricultural Research (532-0128) provides support for PT and PR. Hillside Agriculture (532-0101) supports improved PX. Agricultural Export Services (532-0165) provides support for improved PR. Agricultural Education (532-0082) supports improved AE.

The Mission rated Agricultural Education (532-0082) as having achieved "much" progress, while Jamaica Agricultural Research (532-0128) was rated as having made "some" progress in terms of improving PT (Jamaica Agricultural Development Foundation). But the Mission rated it as being "too early" to assess progress vis-à-vis PR. The Hillside Agriculture (532-0101) project was rated as making "some" progress with PX.

RDO/C: Two projects have components aimed at improving Ag REE. Caribbean Agricultural Research and Extension (538-0164) is being implemented by the Caribbean Agricultural Research and Development Institute (CARDI). West Indies Tropical Produce Support (TROPRO) (538-0163) is being implemented by the Organization of Eastern Caribbean States (OECS) and CARDI, with technical assistance provided by Chemonics International.

The Mission rated Agricultural Research and Extension (538-0164) as having made "some" progress in improving technology generation, technology transfer, and agricultural

education by public research, public extension, and agricultural education organizations, respectively. The Mission indicated that it is yet too early to assess the impact of the TROPRO project on PR and PX.

3. Central American Region

Belize: Three projects have components aimed at improving Ag REE. Livestock Development (505-0006), Commercialization of Alternative Crops (505-0008), and Toledo Agricultural Marketing (505-0016) each provide support to improve PR, PX, and PT. These projects also provide support to improve AE.

Generally, the Mission indicated that it is "too early" to assess the progress of the Toledo Agricultural Marketing project. The Livestock Development and Commercialization of Alternative Crops projects were rated as having made "much" progress in improving PT. The former project was rated as having made "some" progress but the latter "no" progress in improving AE, with the same pattern holding with respect to improving PX. Commercialization of Alternative Crops was rated as having achieved "some" progress in improving PR.

Costa Rica: The Mission identified two projects with components aimed at improving Ag REE: NTAE Technical Support (515-0237), implemented by the private Costa Rican Coalition for Development Initiatives (CINDE); and Northern Zone Consolidation Project (515-0235), implemented by the Ministry of Planning.

The Mission reported that neither NTAE Technical Support nor Northern Zone Consolidation had made progress with respect to improving PR or PX. But "some" progress has been made by these projects with respect to improving PT.

El Salvador: Several current and planned projects have components aimed at improving Ag REE. Water Management (519-0303) provides support for PR, PT, and AE. Support for AE also is provided by Agribusiness Development (519-0327) and will be provided by Coffee Technology Enhancement (519-0362). Other projects containing an Ag REE component are: LC-Sustainable Agriculture, Community Based Rural Development (519-0364), and Technoserve Rural Enterprise Development (519-0382). Planned projects with Ag REE components are Commercial Farming (519-0351) and Sustainable Agriculture (519-0374). Some projects are implemented by a public agency, others by private firms, and some by a mix of public and private participation.

The Mission rated Water Management as having made "some" progress in improving PR and AE. Both Water Management and Agribusiness Development were rated as having made "much" progress with respect to PT. No projects were identified as relevant to achieving progress with respect to PX, while it is "too early" to assess the impact of Coffee Technology Enhancement on PT.

Guatemala: Three projects were identified by the Mission as having Ag REE components, as follows: Highlands Agricultural Development (520-0274), Agribusiness Development (520-0276), and Development Training and Support (520-0384).

The Highlands Agricultural Development project was rated as having achieved "some" progress in PR and PX, while Agribusiness Development also was rated as having made "some" progress in PT.

Honduras: Several current projects have components aimed at improving Ag REE. Three projects provide support for PX: Small Farmer Coffee Improvement (522-0176), Irrigation Development (522-0268), and Land Use Productivity Enhancement (522-0292). Four projects provide support for strengthening PT: Small Farmer Livestock (522-0209), Export Development and Services (522-0207), Honduran Agricultural Research Foundation (522-0249), and Small Farmer Organization Strengthening (522-0252). Zamorano Scholarships (522-0314) provides support for AE. The Mission currently has no projects aimed at improving PR. The Investment Development Project (522-0312) currently is being planned and was identified by the Mission as potentially including support for Ag REE-strengthening.

Further, in addition to all of the above USAID/Honduras-funded projects, the Mission noted that it collaborates in the centrally-funded Communication for Technology Transfer in Agriculture (CTTA) project, three Collaborative Research Support Programs (CRSPs), the RTAC textbook program, and the ROCAP-funded Regional Environment and Natural Resources Management (RENARM) project. All contribute to research, extension, and education activities in Honduras' agricultural sector. The ASHA program has donated more than US$ 11 Million to Zamorano for buildings and facilities. The Mission supports CAPS scholars who study agricultural subjects, both degree and non-degree, in the U.S.

In the area of PX, the Mission rated Land Use Productivity Enhancement as having made "some" progress, while Irrigation Development and Small Farmer Coffee Improvement were rated as having achieved "much" progress. In AE, Zamorano Scholarships was rated as achieving "much" progress. In PT, the Honduran Agricultural Research Foundation project was rated as having achieved "much" progress, while "some" progress was noted in the cases of Small Farmer Livestock, Export Development and Services, and Small Farmer Organization Strengthening.

ROCAP: Several current projects have components aimed at improving Ag REE. Two projects, Regional Coffee Pest Control (PROMECAFE) (596-0090) and Regional Agricultural Technology Networks (PROCACAO) (596-0127), have included components aimed at improving PR and PX. Also, the latter project includes components aimed at improving AE and PT. The Tree Crop Production (596-0117), known as Integrated Pest Management, has focused both on improving PR and PX as well as PT. The Regional Environment and Natural Resources Management (RENARM) (596-0150) project includes components aimed at improving PR, PX, AE, and PT. Regional Agricultural Higher Education (596-0129) aims at improving AE at the Tropical Agricultural Research and Training Center (CATIE) in Costa Rica. Most of ROCAP's agricultural projects support and are being implemented by CATIE.

Regional Coffee Pest Control and Regional Agricultural Technology Networks were given a "some" progress rating vis-à-vis improving PR and PX, while the latter project also was rated as making "some" progress in improving AE and PT. Integrated Pest Management

received a "much" progress rating in PR and PX, while it made "some" progress in PT. Regional Agricultural Higher Education was rated as having made "much" progress in improving AE at CATIE.

C. ARDO Program-Level Performance Monitoring System

This section reviews the status of LAC USAID Missions with respect to establishing a program performance monitoring system to track Mission performance relative to ARD program goals.

1. Andean Region

Bolivia: The goals of the Mission's ARD portfolio are export promotion and development; a successful alternative development strategy; national resource conservation and development; and policy formulation. Success indicators are: (1) increased coca eradication; (2) increased rural incomes; (3) increased km. of farm-to-market roads; (4) increased percentage of population with negative opinions about drug production and use; and (5) increased number of short-term jobs created under PL-480 (especially Food for Work). The ARD Office does not have an ARD program-level M&E plan but the Mission has a program-level M&E plan.

Ecuador: The Mission indicated that its ANRO portfolio contributes to the LAC Bureau's goals of "basic structural reforms leading to rapid and sustained economic growth." The portfolio's specific objectives include: (a) to increase agricultural productivity; (b) to preserve and manage natural resources; and (c) to strengthen private enterprise and promote exports. While the Mission indicated that country performance indicators for each of these objectives are provided in the FY 91-92 Action Plan, the Mission does not have an ANR program-level M&E plan. The ANR Office has attempted to improve the office's M&E system, primarily on a project-by-project basis, mainly through interaction between USAID/Ecuador project officers and host country counterparts. The Mission noted that "results have been mixed, with relatively good M&E systems established in some projects and less than satisfactory systems in others. In some cases, long-term contractor personnel have been asked to provide M&E evaluation data for semi-annual reports, Action Plans, etc. because implementing agencies had not implemented an effective M&E system.

Perú: The goals of the Mission's ARD portfolio are to decrease the illicit production of coca leaves and to promote gainful employment as a substitute for income from coca production. But the ARD Office does not have a program-level M&E plan.

2. Caribbean Region

Haiti: The ARD portfolio goal is: "To ultimately increase farm income and productivity through the development and extension of sustainable agricultural production systems which concentrate on the integration of perennial crops with soil and water conservation practices on the hillsides." The Mission does not have an ARD program-level

M&E plan, but "all projects keep track of a central common set of project outputs which reflect progress towards...purpose level indicators."

Dominican Republic: The Mission's ARD portfolio goals are: "Sustained and equitably distributed private sector-led economic growth and social development in a democratic environment through rapid diversification of the agricultural sector into nontraditional crops with foreign exchange earning potential." The Mission stated that its agricultural portfolio is "very new. Two projects that have been implemented for relatively short periods of time are both developing management information systems. Data from these systems will be used to monitor and evaluate achievement of Ag. strategy goals and objectives." The Mission does not have an ARD program-level M&E plan but monitors progress at the project level toward End of Project Status (EOPS) indicators.

Jamaica: The Mission indicated that its agricultural strategy is focused on two areas--increasing exports and employment and raising incomes of farmers while conserving fragile lands. The Mission reported that it does not have an ARD program-level M&E plan but it does have projects in the Ag REE category.

RDO/C: The Mission's ARD portfolio goals are to maintain and to the extent possible raise incomes and food consumption of the rural poor; stabilize foreign exchange earnings and savings from agriculture; and maintain and enhance the natural resource base. The Mission does not have an ARD program-level M&E plan.

3. Central American Region

Belize: The goals of the Mission's ARD portfolio are to increase agricultural production, improve natural resource management, strengthen the private sector, and promote exports. While the Mission does not have an ARD program-level M&E plan, each Project Paper contains an M&E plan.

Costa Rica: On the declining side of the Mission's portfolio, the goals are to raise rural incomes in selected poverty-prone areas, while the goal on the increasing side of the portfolio is to help decrease the rate of natural resource consumption, destruction, and overuse in the medium term. But the ARD Office does not have a program-level M&E plan and has taken no steps to develop an M&E system to track performance of the Mission's project portfolio vis-à-vis the aforementioned ARD goals.

El Salvador: The goals of the Mission's ARD portfolio are to increase income and create new job opportunities. The ARD Office does not have an ARD program-level M&E plan.

Guatemala: The goals of the Mission's ARD Office are those of: (1) increasing the income of the poor majority; (2) expanding the availability and consumption of food; and (3) maintaining and enhancing the natural resource base. The ARD Office does not have a program-level M&E plan, although each project has developed its own system, while a Mission-level M&E plan is being prepared.

Honduras: The goals of the Mission's ARD portfolio are to: (1) contribute to national economic development; and (2) raise income and nutrition levels through higher volumes of production and better prices for agricultural products; creating more employment; and increasing exports of agricultural products and the production of domestic foodstuffs. The Mission does not have an ARD program-level M&E plan.

ROCAP: The Mission indicated that the Regional Coffee Pest Control and Regional Agricultural Technology Networks projects will be terminating in December 1990; and that additional ARD goals will need to be defined when the "new ROCAP Strategy is in place." The Mission indicated that it does not have an ARD program-level M&E plan. However, the implementing agency (IICA) for the coffee and cacao projects uses its own M&E systems to track the performance of those projects. Also, with respect to the RENARM project, a proposal for the RENARM M&E plan has been received and is being evaluated, with a contract for the project expected to be signed before September 30, 1990.

D. Mission Strategy for Ag REE-Strengthening

While the Missions, as noted in the preceding section, did not identify Ag REE-strengthening as a program goal or as a priority that would be involved in working toward stated Mission goals, most Missions, when asked, were able to articulate some elements of a strategy for strengthening Ag REE in their respective countries. This section reviews Mission responses to the survey request for a description of Mission strategy elements for Ag REE-strengthening.

1. Andean Region

Bolivia: The Mission identified the following as the priority issues relative to improving Ag REE: (1) sustained GOB commitment; (2) GOB strategy; (3) absence of an area/crop focus; and (4) human resources. The Mission's strategy to deal with these issues includes working with the private sector; coordinating with other donors; and supporting crop-specific packages and <u>not</u> separate activities. The strategy is best articulated in Santa Cruz (wheat), Cochabamba (flowers), and Chapare (tropical products such as pineapple, tumeric, coffee, macadamia, and ginger). The Mission plans to develop projects involving all three REE functions, stating its rationale as follows:

> The experience [of the] past 10 years, especially in credit programs and/or in other projects implemented [that] we consider [have worked is that] implementation must be supported as a package (credit, technical assistance, extension, education, marketing, quality control, etc.).

Ecuador: The Mission stated that the greatest priority is "increased political commitment on the part of the GOE toward" Ag REE, and that:

> Over the past decade, the Government has allowed the REE system to steadily deteriorate. Highly trained agricultural scientists were forced to seek alternative

employment due to the growing gap between the public sector salaries they received and what they could earn elsewhere.

A second priority, the Mission noted, "is to forge a true REE system that involves public sector research and extension, private businesses and associations, and agricultural universities and schools. At present REE efforts are fragmented, communication is poor, and results have therefore suffered." A third priority "is to allocate scarce REE resources more efficiently. The public sector research program, for example, is trying to address too many commodities with too few resources, with the result that progress has been limited in all areas."

The Mission's strategy includes developing a concept paper for non-project assistance to Ag REE in Ecuador. It also states that:

> If any funds are to be provided to the public sector, the GOE must agree to make INIAP autonomous (so that, among other things, it can increase salaries for agricultural scientists) as well as to significantly increase the budget for INIAP. AID funds may also be increased to support REE efforts in the private sector and at agricultural schools. The Mission intends to continue to channel its assistance to REE primarily through the Foundation for Agricultural Development (FUNDAGRO), which has made excellent progress over the past three years in carrying out its REE programs and in establishing itself institutionally.

The Mission indicated that its strategy entails developing projects that involve all three REE functions, the rationale being that sustaining improvements in "agricultural productivity and management of natural resources requires that all three functions—research, extension, and education—be strengthened on a continuing basis. Public-private sector collaboration, enabled by sustained political support, is vital to the establishment and maintenance of a strong REE system."

Perú: The Mission responded that sound financial management across all sectors is vital to the GOP and that administrative, financal, and technical leadership need to be improved. But the Mission stressed that: "Support of the educational system, research network, [and] technology transfer cannot be the function of the international donor community. The government must be made aware of a need to carry out sound policies related to agriculture in order to encourage production, related marketing, export management and credit." Further, there is a need to deal with terrorism in order "to provide the security" to accomplish development of the agricultural sector."

The Mission's strategy for dealing with these problems is to support policy change, encourage fiscal adjustments, educate against narcotics, support the government's anti-terrorism activities, promote modernization of the legal system, and promote democracy. This strategy "is based on the principle that getting the house in order is a prerequisite for change." But the Mission indicated that its strategy includes developing projects that include all three REE functions.

2. Caribbean Region

Dominican Republic: The Mission identified "establishing sustainable effective institutions" as the priority issue with respect to improving Ag REE. The Mission's strategy is to "continue to channel resources to [the] most effective institutions which can be made sustainable." This strategy includes developing projects involving all three REE functions, and is influenced by a recognition of the "total interrelationships among the three" and that there has been "no apparent change in GODR policies."

Haiti: The Mission identified the following priority issues relative to improving Ag REE in Haiti: (1) political stability and continuity; (2) readjustment of the government's budget; and (3) effective donor planning and coordination. The Mission, recognizing that the above issues "exist primarily for reasons beyond the control of the USAID," indicated that it will continue with its present strategy of targeting Mission agriculture and soil and water conservation efforts on "the hillside, rural population through PVOs and NGOs." The Mission indicated that its strategy is to develop projects involving agricultural research and extension, the rationale being as follows: "Previous practical experience, historical assessments and evaluations all indicated that soil and water are the number one limiting constraint to improved agricultural production in Haiti. This fact, coupled with a 75% rural hillside population, has led to our present Mission strategy."

Jamaica: The Mission identified the following priority issues for research and education: lack of budgetary support for research; low salaries for and low morale among researchers; poor leadership; and lack of trained (advanced degree) personnel. The identified priority issues for extension were: effectiveness of technologies being extended; agricultural productivity; and sorting out institutional issues of implementation. The Mission's strategy to address each issue follows:

- Research: Fund research via JARP (532-0128), support long- and short-term training, and support adoption of an Administrative Reform Program to enhance salaries.
- Extension: No overall strategy, only project-based strategies.
- Education: While there is no specific agricultural education strategy, the Mission expects, through the Agricultural Education project and other education projects, to increase the number of trained persons.

The Mission noted that: "A strategy is evolving which expects to strengthen major aspects of private sector agricultural development, develop public sector natural resource management capabilities and support public and private sector agricultural initiatives toward greater productivity." The Mission plans to develop projects involving all three REE functions.

RDO/C: The Mission identified the following priority issues relative to improving Ag REE in the Eastern Caribbean: (1) greater integration of research and extension; (2) more core funding for research and extension; (3) research priority setting mechanisms; and (4) professionalizing extension services. The Mission's strategy is to strengthen CARDI's

ability "to carry out farming systems research and to strengthen the capability of a regional extension/education organization to backstop national extension systems." The strategy also calls for strengthening the links between research and extension. Toward implementing this strategy, the Mission plans to develop projects involving research, extension, and education. The rationale underlying this strategy is that no national organizations exist and it would not be cost-effective to establish such organizations. Also, strengthening a regional extension/education entity means that the required "backstopping will go on long after our project has ended." The establishment of linkages "should ensure that technology is transferred and that farmers and extensionists participate in [setting] research priorities."

3. Central American Region

Belize: The Mission indicated that "the private sector will have to carry the larger role and that efforts should be made to ensure private sector institutions, particularly as related to Research/Extension, [are] incorporated into the various programs supported by donors." At the higher education level:

> more encouragement should be made to ensure Belize as a CARICOM nation participates more fully in University of West Indies programs. It's not logical for Belize to have a comprehensive agricultural education system at the B.S. to Ph.D. level. Simply cannot afford—and in a country of less than 200,000—it is not justifiable.

The Mission plans to focus on "selective targets of opportunity evolving around nontraditional agricultural exports, natural resource management and protection, and tourism." The Mission indicated that its strategy is to integrate the REE functions into any new projects on a "case-by-case basis which could contain one, two, or three of the functions for support in any given new activity." Examples of this approach would include research and development in NTAE crops, and extension in natural resource management activities. However, the Mission stressed that if one is suggesting "straight-line traditional institution building projects aimed at improving the REE functions, it is not in the cards! Again, REE for any project could emphasize one function more than the other, depending on the level and need."

Costa Rica: The Mission indicated that there is "no perceived need for bilateral projects in these areas" and that the Mission is "phasing this part of the portfolio to zero. No new obligations are planned through FY93." Hence there is no Mission strategy with respect to improving Ag REE in Costa Rica. The Mission states:

> Costa Rica is anomalous in its high per capita income and its high literacy rate. Therefore, private sector solutions have been easier to implement than in other, less advanced countries. The AID program in Costa Rica is declining rapidly in funds, resulting in a much reduced portfolio and the resulting focus on only natural resource management.

El Salvador: The Mission identified the following priority issues relative to improving Ag REE: (1) national agricultural policy; (2) commitment to long-term funding; (3) a massive deepening of human capital; and (4) complete reorganization of Ag REE institutions. The Mission's strategy to deal with these issues includes: (1) policy dialogue; (2) technical assistance to develop a modernization plan; and (3) some (limited) local counterpart funding for budget support. The Mission indicated that its strategy includes developing projects including all three REE functions, although support would be provided on a limited basis and not necessarily through the same organization. But the Mission indicated that the host country "must show interest in change before USAID will invest more (any) money."

Guatemala: The Mission related that Guatemala has been the pioneer in farming systems research in the LAC region but that the approach has not been sustained. Nor has it benefitted from recent advances. "A more coordinated effort between agricultural research, extension, and education is imperative." There also is a need for closer public and private collaboration. The Mission's current plan for improving Ag REE:

> is not addressing the main issue of coordination and support. Funding has been made available to support research and extension but in an independent manner. The systems approach is being replaced by a commodity approach.

The Mission's strategy is to develop projects involving only research and extension. The Mission's position "reflects the skepticism for a system approach to agricultural research, extension, and education; it also reflects the current emphasis to support nontraditional agricultural exports."

Honduras: The Mission identified the following priority issues with respect to improving Ag REE in Honduras: (1) elimination of barriers that inhibit access to production inputs, production information, and adequate technology; and (2) establishing endowments and/or other means for sustained funding for responsive research, outreach, and higher agricultural education. The Mission strategy to deal with these issues includes:

- Create local currency endowments to provide a stable and secure source of funding for: (1) agricultural education scholarships, and (2) adaptive research and outreach activities within the private sector;

- Improve upon and extend the country's unified extension methodology to additional rural extension agency offices;

- Continue pressure for adequate public funding of CRSP activities and other priority research programs; and

- Pursue policy changes by the GOH that will stimulate production, domestic consumption, and export.

The Mission plans to develop projects involving all three REE functions, the underlying rationale being that "sustainable agricultural sector growth will require adequate numbers of trained agriculturalists, as well as responsive research and outreach programs that stimulate technology adoption by individual farmers. All these needs must be addressed."

ROCAP: The Mission identified the following priority issues relative to improving Ag REE in Central America: (1) willingness on the part of C.A. Governments to be responsible for their own growth and cooperate with other countries in the region; (2) failure to maintain technological advantage to upgrade productivity; (3) lack of persistent financial commitments; (4) lack of problem solving oriented agriculture research; and (5) maintenance and improvement of undergraduate educational facilities.

The Mission's strategy to address these issues is being defined. "However, weak professional resources, which limit the capacity to develop and extend technology and manage sectorial performance will undoubtedly become a major focus of the Regional Strategy." While the Mission's Regional Strategy has yet to be determined, it states that:

> it is very likely that future AID support will concentrate on a few of the Centers of Academic excellence with selective training abroad. This is based on the Central American Presidents' Commitment to stimulating policies, programs, and projects in education, scientific research, and technology dissemination.

The Mission strategy is also to strengthen networks among Ag REE entities for exchange of information; technology generation and transfer; apportionment and coordination of research and educational priorities along established lines of comparative advantages; allocation of scarce resources; and harmonization of curriculum and instruction, entrance requirements, and degree programs with national systems.

With specific reference to CATIE, the Mission indicated that, underlying CATIE's problems (budget, personnel, program direction, technology generation and transfer, etc.) is a "fundamental issue...related to differences in values and priorities regarding financial discipline, program direction and stewardship of resources between management and the Board and the donors upon which it depends." Beyond recognizing the need to address these problems, the focus of the activities under RENARM and the Tree Cropping project is on problem-solving research, outreach, and training. Ag REE at CATIE is, in the Mission's view, improved in the degree to which objectives in these three areas are mutually supportive and reinforcing in addressing problems of increasing agricultural productivity and improving the management of natural resources.

ROCAP plans projects involving all three REE functions. The rationale underlying the Mission's strategy was summarized by the Mission from the RENARM Project Paper, as follows:

> There is a constant requirement for research, development, and modification of technologies to solve problems unique to the region. The network of public institutions that exists in the region is inadequate to the task, has insufficient financial

resources, and for the most part, diffuse research and training objectives. Strengthening the scientific and technological capability of the region is a necessary first step to designing and executing the interventions required for a rational, profitable and sustainable exploitation of natural resources.

E. Management Questions Facing the Mission

This section reviews the Mission responses to the survey item requesting an indication of management questions of concern to the Mission with respect to Ag REE strengthening.

1. Andean Region

Bolivia: The Mission indicated a concern for increasing public and private sector involvement in agricultural research, particularly in nontraditional export crops. There is a feeling that the Mission should encourage greater private sector involvement in agricultural research. The Mission stated that it would be helpful if there were a clear vision of what the GOB wants to do in this area and a valid commitment to carry through; however, this area is not viewed as a priority area of focus. Further, there is an absence of in-house expertise in the Ag REE area. The Mission is currently formulating its "alternative development" strategy.

Ecuador: The Mission indicated that support to Ag REE "must remain a priority in the...agriculture and natural resources portfolio." But increased funding for public sector research will depend on the GOE demonstrating a commitment to the idea that:

> rebuilding REE, e.g., collaborative arrangements between private producer associations and Ecuadorean agricultural schools, can yield benefits, but their magnitude will be somewhat limited. Maximum impact can be achieved only if all...parties, including the public sector, are involved and working together to identify problems, test solutions, and extend new knowledge and technologies to producers.

However, as the Mission notes, the "roles of these actors must be well-defined." For example, organized producers of export crops probably should take the lead in financing REE activities for their commodities, while INIAP should concentrate on crops produced primarily for domestic consumption.

The Mission noted that it is or soon will be addressing REE management questions:

> This will be based upon the just finished Agricultural Assessment of Ecuador, a concept paper on non-project assistance for REE, and an assessment of the country's natural resource sector to be carried out over the next two years. Management issues in natural resources will also be considered during the...design of the Sustainable Uses for Biological Resources project.

Perú: Three questions were identified: (1) Should USAID/Perú continue to support public sector agricultural research? (2) Should USAID/Perú attempt to develop a better

public sector research capacity? (3) To what extent should USAID/Perú continue support to the agricultural education system? In considering these questions, the Mission noted that "strategy development appears to be the most elusive element," with politics playing an important role in any initiative's success or failure.

2. Caribbean Region

Haiti: The Mission identified the following four questions as being most important: (1) Should the Mission maintain its narrow hillside focus on agriculture or expand to impact those areas which might have more immediate, macro-level impact? (2) Should the Mission support revitalization of public sector research capabilities? (3) Should the Mission continue to support creation and expansion of research units through project structures? (4) Should the Mission continue to expand extension activities through PVOs?

To address these issues, increased attention needs to be focused on the broad question of policy analysis, including the preparation of scopes of work for such policy analysis and associated studies (assessments) and strategy formulation.

Dominican Republic: The Mission indicated that it "should continue [its] present course" but expressed concern about "how to accomplish [this] with reduced Mission resources."

Jamaica: The Mission indicated that the Agriculture and Rural Development Office:

> does not consider the problem of support for [agricultural] research, extension or education as a management/operational problem but rather a strategic policy one. The important questions are: (1) What is needed in Jamaica for agriculture to prosper? (2) What constraints can be reduced or eliminated through projects? (3) What support can or will the GOJ provide to what kind of projects: education, research and/or extension?

The Mission noted that "management questions arise after the policy questions have been answered and the strategy established, i.e., how many DHs, FSNs and/or PSCs will it take to manage the portfolio?" Comprehensive economic studies are needed to determine the importance of agriculture in the Jamaican economy.

RDO/C: The Mission indicated that it currently does not have any important management questions regarding research, extension, and education. "The Mission decided recently to maintain support and to concentrate [on] nontraditional export crops."

3. Central American Region

Belize: The Mission indicated that agriculture and tourism are the two areas with the greatest growth potential. Without good long-term planning and management, these areas can pose a threat to tropical forests, the barrier reef, and the greatest biodiversity left in Central America. The Mission stated that it "envisions a greater responsibility of R&D as

part of the private sector (which is already moving in that direction) and government basically addressing 'regulatory' functions." Also, ways need to be identified to help the GOB to develop its capacity to rationally plan and manage resources effectively to guide economic growth, while continuing to address constraints to growth such as infrastructure, managerial skills, and a narrow export product base. There also is a need to identify how to maximize job creation, government revenue, and resource protection.

Costa Rica: The Mission responded "not applicable."

El Salvador: Two questions were identified: (1) Should USAID/El Salvador concentrate efforts in Ag REE in the public sector? (2) What is the proper mix of public/private sector support?

Guatemala: The most important question the Mission faces is whether to reduce its support for public agricultural research institutions and to increase support for private research organizations, i.e., a private foundation for agricultural research. The Mission has received a proposal for establishing a private Foundation for Agricultural Research. Based on review of this document, the Mission will identify areas for further study.

Honduras: Two questions were identified: (1) How can the Mission maintain a well-rounded agricultural portfolio which addresses these and other sector issues in the face of dwindling DA and ESF funding? (2) Should the Mission continue to support projects carried out by poorly organized and administratively weak public sector entities or should the Mission place its resources in a program to assist in reforming and restructuring Ministry organization and service delivery mechanisms? The Mission identified two areas in which assistance is needed:

- Assistance in examining the second of the above two questions, that is, continuing to fund public sector programs through weak and ineffective public entities, or diverting resources to institution-building and strengthening public sector entities, thus improving the GOH structure and services in the agricultural sector.
- Assistance in developing the PID and PP for the upcoming agricultural sector adjustment program.

ROCAP: The Mission indicated that AID's development assistance "will hinge on the willingness of the regional governments to reform their macroeconomic and sectorial policies." The Mission identified the following as meriting attention:

> (1) Study and analysis of regional progress being made to correct discriminatory macroeconomic policies and irrational sectorial policies; (2) the neeed to establish a directory of agriculture research and education; and (3) an analysis of the factors and/or requirements for building a coherent C.A. agricultural science, technology and higher education system.

With respect to CATIE, the Mission indicated that in about a year's time (September 1991), the Inter-American Board of Agriculture (JIA, as its known in Spanish) will meet to

consider whether the Inter-American Institute for Cooperation on Agriculture (IICA) should re-absorb CATIE or complete its independence and require that the member countries support it more fully.

F. Non-project Assistance

This section reviews Mission views on the potential of non-project assistance to strengthen Ag REE. Non-project assistance entails the use of policy dialogue coupled with ESF and/or PL-480 local currency generations to stimulate change in governmental policy. For Ag REE, such change could include: (1) the implementation of governmental policies/programs more supportive of Ag REE institutions (e.g., autonomy for public agricultural research and extension currently under the political wing of a Ministry of Agriculture); and (2) an increase in public resources allocated to Ag REE institutions.

The concept of using non-project assistance for strengthening Ag REE has been proposed by Brown (1990c), although Brown refers to this concept as NonProject Sector Assistance (NPSA). In the Andean region, the concept is being explored by USAID/ Ecuador. USAID/Bolivia indicated that it is not considering this concept. While USAID/Perú recognized the potential of non-project assistance as a funding source, the Mission indicated that using such funds to stimulate change in the level of public resources allocated to Ag REE institutions is "questionable." The Mission voiced concern that using project funds to cover operating expenses of Ag REE institutions would "deplete any project funds and severely weaken the effects of...any such project."

With the exception of USAID/Honduras, USAID Missions in the Caribbean and Central American regions are not considering the possibility of non-project assistance as a vehicle for strengthening Ag REE in their respective regions. For these Missions, Ag REE is only one of a number of areas that may be addressed in Mission policy dialogue with the host country. In some cases, the concept has less immediate potential relevance. Such examples would include Haiti, where the Mission currently has no bilateral projects with the GOH; in Belize, where the Mission does not have ESF funds for these purposes nor does it have a PL-480 program; or in Costa Rica, where the Mission reported that Ag REE is not a priority area. For several countries (Jamaica, El Salvador, Guatemala, and Honduras, ESF and/or PL-480 funds provide funding for Ag REE activities. For example, in Guatemala, a greater allocation of public resources for supporting ICTA is part of ongoing ESF negotiations.

USAID/Honduras was developing a non-project assistance program ("Agricultural Sector Adjustment Program") to influence a wide variety of sector policies. The Mission indicated that its agenda is clearly directed at achieving policy reforms by developing a sectoral program that will incorporate ESF, DA, and PL-480 resources in a program combining structural adjustment and specific project-type activities. This program will work toward improving not only the allocation of resources to Ag REE but also on how REE activities are carried out. The program was to have had a significant impact on public sector resource allocations for research, extension, and education; however, the Mission subsequently decided not to go ahead with the program.

G. Opportunities to be Pursued

This section reviews Mission responses to the survey questionnaire request for identification of areas of opportunity that should be pursued by USAID or other donors.

1. Andean Region

Bolivia: The Mission noted that AID should emphasize policy dialogue and strategy formulation, encourage Bolivia to pass stronger environmental laws and to develop a natural resources strategy. Potential opportunities for other donors include resettlement in the Eastern Lowlands (IBRD) and integrated pest management (GTZ).

Ecuador: The Mission indicated that "non-project assistance to INIAP, perhaps including some technical assistance, seems promising, provided the GOE fulfills it obligations." Also, the Mission stated that its "existing project with FUNDAGRO should be sufficient to handle most activities in the REE area" through April 1993. With respect to other donors, the Mission noted that the Inter-American Development Bank has financed a large REE program called PROTECA, implemented by the MOA, but that:

> the program has floundered, expenditures have been very slow, and impact negligible. Given this experience, it may be advisable for other donors to work through FUNDAGRO or other private organizations, or through the limited number of agricultural technical schools with some REE capability.

Perú: The Mission noted that AID should pursue opportunities in seed production and extension, the latter broadly defined as including research, technology, and management. Also, the Mission sees opportunities in livestock promotion. By comparison, opportunities for other donors include transportation networks since this is an area in which AID does not work. The Mission noted that: "The unique, chaotic, hyperinflationary character of this country, complicated by high security risk and [a] drug-dependent economy makes answering this type of questionnaire most difficult. Historically the country has seen its worst in terms of [agricultural research and extension] in the past [three] decades. Likewise, it has seen its worst in financial stability during the past four years."

2. Caribbean Region

Dominican Republic: The Mission noted the following as opportunities that should be pursued by AID: debt-for-education swaps, endowment funds, and training. Donors should pursue opportunities in infrastructure and technical assistance. With the exception of the reference to infrastructure, all of these reflect the Mission's acknowledgement of a need to strengthen Ag REE, particularly with regard to the sustainability of educational and research institutions.

Haiti: The Mission noted four areas of opportunity that should be pursued by other donors: (1) introduction and testing of drought resistant cereals; (2) identification and use of

farm byproducts as sources of animal feed; (3) integration of livestock production and aquaculture; and (4) strengthening of public sector capability for extension activities.

Jamaica: The Mission noted that AID should pursue opportunities to develop degree training, information networks, and legal mechanisms for returning extension, research, and education professionals.

RDO/C: The Mission did not identify any opportunities to be pursued by AID, stating that: "We are doing as much as we can." The following were identified as opportunities to be pursued by other donors: "small ruminant research and extension. endowments for public research; private sector extension; and working with farmers groups, input suppliers, etc."

3. Central American Region

Belize: The Mission noted the need for AID to continue and expand current programs designed to identify, promote, and market export crops through the private sector. Two other areas meriting attention are forestry and fisheries production and export which includes improving fishing conservation policies and compliance. Other donors should address the problems of infrastructure (e.g., roads/port facilities) and credit. However, the U.S. is the leading donor in Belize.

Costa Rica: The Mission identified no opportunities with respect to Ag REE-strengthening that should be pursued by AID With respect to opportunities for other donors, the Mission commented that "preference should be given to privately managed operations, but that's unlikely to occur in the policy environment which seems perennial in the sector."

El Salvador: The Mission noted technical assistance and training as areas of opportunity that should be pursued by AID Opportunities for other donors relate to infrastructure.

Guatemala: AID should pursue how to involve the private sector in agricultural research and extension, "which will be identified once the proposal for a private Ag. research foundation is reviewed." The Mission stated that other donors should pursue the opportunity of "how to strengthen public Ag. research and extension systems to enhance the effectiveness of the private sector in both areas."

Honduras: The Mission noted the following as areas to be pursued by AID: policy dialogue and use of non-project assistance mechanisms, and promotion and enhancement of private sector research and outreach capacity. Opportunities identified for other donors were: support and enhancement of the GOH's research and extension structure; and public sector agricultural education, especially at the secondary school level.

ROCAP: The Mission noted that "ROCAP could provide strong support to Central America Governments in their efforts to develop a network to generate and [adapt] technology to the region's ecological conditions." Other donors could play a role by

providing financial and technical support to IICA and CATIE. Further, the Mission suggested that AID consider developing "a strategy for guiding...involvement of USLG colleges and universities in REDCA in furtherance of the [Agency's] objectives for the region." Also, the Mission suggested that donors such as IDB and the World Bank should "more fully consider indigenous sources of technical assistance such as CATIE in carrying out their projects in watershed management and other areas."

H. Summary

1. Trends in Funding for Ag REE-Strengthening

In the Andean region, Mission funding for PR increased in Bolivia and Perú. However, Mission ARD programs in both countries, as in Ecuador, began to place greater emphasis on supporting private TG&T, working with foundations (FUNDAGRO in Ecuador and FUNDEAGRO in Perú) and producer associations and PVOs (Bolivia). While USAID/Ecuador did not allocate any funding for PX, the Missions in Perú and Bolivia have continued to provide some funding for PX, mainly to support implementation of coca substitution (or alternative development). The Missions provided some funding for agricultural education, either to support institutional development of agricultural universities (e.g., UNA in Perú) or to fund scholarships for Andean students to pursue their agricultural studies at Zamorano in Honduras. All three Missions experienced increased support for private TG&T, this partially driven by continuing frustrations with trying to support institutional development of public agricultural research organizations.

In the Caribbean region, Mission funding for PR and PX fell (or was terminated) during the 1980s in the Dominican Republic and Haiti, but increased in Jamaica and RDO/C, increased funding in the latter case being to support PR carried out by a regional agricultural research center (CARDI). AE funding increased in three countries, with no AE funding allocated in Haiti. Funding for PT increased in three countries; RDO/C felt that adequate funding was available to private organizations in the region. The pattern of declining Mission support for PR and PX, and increasing support for private TG&T, was most apparent in the case of the Dominican Republic.

In the Central American region, ROCAP has supported a public regional agricultural research and education organization (CATIE) that works closely with country-level public and private TG&T organizations. Generally, within the individual AID-assisted countries in the Central American region, there has been growing funding support for private TG&T, while increased funding for public research (PR) and extension (PX) became increasingly rare. With respect to PR and PX, USAID/Costa Rica provides no support, USAID/Belize little support, and USAID/El Salvador only a "slight" increment of support. While the Missions in the other two countries—Guatemala and Honduras—continue to provide funding for public agricultural research and extension, the emphasis is on funding public sector participation in project implementation, and <u>not</u> on institution building as in earlier USAID-funded institution building projects (e.g., AREE in Perú).

The reader may note a contradiction between: (1) the finding in Chapter II (A.2) that ARDN funding for agricultural research and extension in the Andean region declined during the 1980s, and (2) this chapter's finding that nine LAC USAID Missions reported increased funding for PR and PX, while twelve Missions reported increased funding for PT. This contradiction is resolved if one recalls that ARDN funding, which is comprised of Development Assistance (DA) and Economic Support Fund (ESF) monies, does not include PL-480 local currency generations. As ARDN funding declined during the 1980s, PL-480 funds potentially became an increasingly important source of funding Ag REE components of Mission ARD projects. However, as shown in Chapter II's Table 2.13, PL-480 Title I local currency generations in recent years (from FY86 to FY88) have been constant (five countries) or have declined (six countries). PL-480 Title I local currency generations increased only in the case of one country (Ecuador).

Thus, if PL-480 Title I funding was used to support Ag REE-strengthening, this only could have occurred in two ways: (1) Missions began to reallocate a larger share of PL-480 Title I funding to support Ag REE activities; or (2) Missions began to allocate available PL-480 Title II local currency generations to Ag REE-strengthening. The latter possibility would make sense in the context of USAID Missions beginning, over time, to place increased emphasis on getting the private sector (PVOs) involved in Ag REE activities. Many LAC USAID Missions have sought to pursue institution building objectives with respect to private sector TG&T organizations (e.g., agricultural research foundations) that AID assisted in creating in the LAC region (e.g., FHIA in Honduras).

It may also be the case that Mission-reported funding increases for PR and/or PX were actually very small (e.g., "slight" as reported by USAID/El Salvador), with funding, be it from PL-480 or ARDN accounts, going to support project implementation and not to traditional development assistance of the type associated with building public agricultural research and extension institutions.

2. Current Mission Projects Having Ag REE Components

Generally, there has been a trend toward projects supporting Ag REE as a component of project implementation (e.g., agricultural research and extension as a component of the Chapare Regional Development Project's coca substitution activity). Few projects aim at traditional public agricultural research and extension "institution building" objectives. With few exceptions (e.g., ROCAP's support of CATIE and RDO/C's support of CARDI and UWI), USAID Missions in AID-assisted LAC countries are placing reduced emphasis on public sector Ag REE institution building, either public sector agricultural research and extension organizations or agricultural education organizations (e.g., universities). On the other hand, several Missions are very concerned with "institution building" and achievement of organizational sustainability with respect to private agricultural TG&T organizations (e.g., FHIA, Honduras; FUNDAGRO, Ecuador; and FUNDEAGRO, Perú).

Generally, USAID Missions in AID-assisted LAC countries rate their projects as having made at best only "some" progress with respect to developing the agricultural TG&T capability of public sector Ag REE organizations, although several projects were rated as

having achieved "much" progress with respect to agricultural education, particularly in the case of regional organizations—CATIE in Central America and UWI in the Caribbean. On the other hand, the Missions tend to assign higher ("much") progress ratings to projects that have provided support for agricultural TG&T in private sector organizations.

3. ARD Program-level Performance Monitoring System

None of the Missions reported having a program-level ARD M&E plan. Some Missions try to track ARD portfolio progress relative to stated goals [End of Project Status (EOPS) indicators] through project-generated data. No Mission reported having a program-level goal with respect to Ag REE-strengthening nor was this area identified as a priority that would be involved in working toward the various stated program goals.

4. Mission Strategy for Ag REE-Strengthening

Several points may be highlighted in summarizing the Mission responses on their strategies for strengthening Ag REE in the LAC region. First, each LAC AID-assisted country has a need to develop improved agricultural production and/or natural research management technologies. This point was well stated in ROCAP's RENARM PP (cited above), as follows: "there is a constant requirement for research, development, and modification of technologies to solve problems unique to the region." Second, as the RENARM PP also notes, the network of public institutions in the region is inadequate to the task, "has insufficient financial resources, and for the most part, diffuse research and training objectives. Strengthening the scientific and technological capability of the region is a necessary first step to designing and executing the interventions required for a rational, profitable and sustainable exploitation of natural resources."

Based on this chapter's review of Mission statements about their strategies for strengthening Ag REE, these two points from the RENARM PP summarize the key problems faced by most of the LAC USAID Missions, regardless of the specific sub-region in which each Mission is located.

In the Andean region, each of the Missions is concerned with the need for increased government commitment to support Ag REE-strengthening. Absent such a commitment, Mission strategies recognize the need to encourage and facilitate increased private sector involvement in agricultural TG&T, particularly to improve the targeting of scarce resources on those crops having the highest priority. Further, especially as noted for Bolivia, there is a need to develop human resources to carry out TG&T activities. Each of three Andean USAID Missions indicated that it would be developing projects involving all three functions.

In the Caribbean region, each of the USAID Missions serving the Dominican Republic, Haiti, and Jamaica voiced recognition of the need to establish government commitment (e.g., budgetary support) to strengthen Ag REE. In the meantime, Mission strategies for Ag REE-strengthening primarily focus on working with the private sector--PVOs and NGOs in Haiti, and "agricultural development foundations" in the Dominican Republic and Jamaica. RDO/C stressed the need to continue strengthening CARDI, UWI,

and mechanisms for linking research and extension. Overall, each Mission indicated that it would be developing projects involving all three REE functions, although USAID/Haiti did not include the education function.

In the Central American region, a somewhat different pattern of responses emerged, reflecting variation among the countries in the region. At one extreme, the Mission in Costa Rica indicated that it is phasing out projects involving Ag REE, with the Mission's focus now turning to natural resource management and "private sector solutions." But current Mission projects are providing support for the Regional Agricultural School for the Humid Tropics (EARTH) and for NTAE crop adaptive research and technology transfer carried out by CINDE/DIVAGRI. At the other extreme, the Mission in Belize is pushing for increased private sector involvement in research and extension, and is seeking to ensure that Belize, as an English-speaking country and CARICOM member, participates more fully in CARDI and UWI programs in the Eastern Caribbean. The Mission would only incorporate individual REE functions on an "as-needed" basis into each new project.

Between these two extremes, the remaining Central American countries reviewed (El Salvador, Guatemala, and Honduras) face a common need to establish government commitment (i.e., funding) for Ag REE-strengthening. Lacking such a commitment, Mission Ag REE-strengthening strategies increasingly are focusing on the private sector--FUSADES/DIVAGRO in El Salvador, an Agricultural Research Fund in Guatemala, and FHIA and Zamorano (Pan American School of Agriculture) in Honduras. Each Mission recognizes a need for public and private sector collaboration in agricultural TG&T, but Agency assistance increasingly focuses on the private sector rather than the public sector.

The emphasis by these Central American USAID Missions on the need to establish government commitment to Ag REE-strengthening also is the basis of ROCAP's strategy for regional Ag REE-strengthening. ROCAP stressed that the Central American governments must be willing to find a way to overcome the lack of persistent financial commitment for public TG&T. ROCAP's strategy highlights the need to improve agricultural education as the basis for overcoming "weak professional resources" which "limit the capacity to develop and extend technology and manage sectorial performance."

Finally, it is apparent that the Missions are focusing their Ag REE-strengthening efforts on private sector targets of opportunity (e.g., producer associations in Ecuador, PVOs and NGOs in Haiti, an agricultural research foundation in Honduras, a regional research and education center in Central America). This focus on private sector and regional approaches to developing agricultural TG&T capability in AID-assisted LAC countries represents a major refocusing of the Agency's approach to strengthen Ag REE in the region. For many years, the Agency's strategy for Ag REE-strengthening was based on the idea of building all-encompassing public agricultural TG&T organizations modeled on the "three-legged stool" concept of the Land Grant university, with agricultural research, extension, and education being provided through a single organization (e.g., an agricultural university, a public sector Ministry of Agriculture, or an autonomous or semi-autonomous agricultural research, extension, and training institute).

Over time, however, the Missions came to understand that the Land Grant model, without appropriate public sector institutional and policy changes, cannot be implemented or sustained in the LAC countries that AID has sought to assist. This has led USAID Missions in the LAC region to place increasing emphasis on the potential TG&T role that can be played by the private sector; at the same time, these Missions have placed less and less emphasis on attempting to work with the public sector. In the extreme, USAID Missions are now asking whether their programs should include support for strengthening public Ag REE organizations.

Some of these concerns were well expressed by USAID/Belize in one of this Mission's responses. The Mission stated that, in "preparing [its] responses, one almost gets the feeling that someone is trying to recapture another era that essentially is not reflective of today's scene." As the Mission's respondent stated:

> Like many Missions, there is no longer (except perhaps in name only) where an Ag or Rural Development Office confines itself to all the traditional Ag/RD projects. Natural Resource Management/Environment, nongovernment or private sector activities as in the case of Belize are part of the Ag portfolio. The historic REE approach of having straight forward institution building projects as the cornerstone of the ADO portfolio [is] not as prevalent as [it was] even 5 years ago. Yet, many of the principles/processes for using REE are as important to developing natural resource management/environmental/private sector activities as they [are] to traditional production programs of agriculture.

5. Management Questions Facing the Mission

Generally, the management questions raised by the various LAC USAID Missions reflect a variety of concerns; however, there is an apparent pattern to or hierarchy of these concerns. At the lowest level of this hierarchy are those Missions that have decided, rightly or wrongly, that agriculture is not a problem per se or is not the major problem. For example, USAID/Costa Rica is now winding down the agricultural side of its portfolio and increasing the portfolio's natural resources side. Obviously, within such a context, the Mission will perceive the need for Ag REE-strengthening as being relatively low. Another illustration that may be cited is the USAID/Panamá Mission. In 1986, this Mission was asking whether it should terminate its programs in agriculture, since agriculture represented only 14% of the country's overall GDP. Similarly, USAID/Jamaica noted that comprehensive economic studies are needed to determine the importance of agriculture in the Jamaican economy.

Assuming that agriculture is recognized by the Mission as being important, the next higher level of the hierarchy is that of whether technology is a constraint on agricultural growth and economic development. For example, USAID/Jamaica noted that its ARD office:

> does not consider the problem of support for ag research, extension or education as a management/operational problem but rather a strategic policy one. The important

questions are: (1) What is needed in Jamaica for agriculture to prosper? (2) What constraints can be reduced or eliminated through projects? (3) What support can or will the GOJ provide to what kind of projects: education, research and/or extension?

Generally, however, most LAC USAID Missions recognize the need for and potential impact on their host-country agricultural sectors of farmers being able to improve their access to productivity-increasing agricultural production and marketing technologies.

The question faced by these Missions is not whether there is a need for improved agricultural TG&T but rather how the Mission can most effectively help assisted countries to develop their agricultural TG&T capability. But this question points to a number of additional questions which, in effect, constitute higher levels on the hierarchy of concerns. The first of these higher-level questions being asked by most LAC USAID Missions is about the relative emphasis that Missions should place on nontraditional agricultural export (NTAE) crops as compared with traditional food crops grown by small commercial and subsistence farmers for domestic consumption. Research on these traditional food crops continues to be carried out primarily by each country's public sector national agricultural research system (NARS). But increasing concern has been expressed that the TG&T capability of the NARS in many LAC countries is in a serious state of decline. This concern was fully evident in the preceding chapter's review of USAID Mission assessments of the status of Ag REE systems in the LAC region.

The declining state of NARS TG&T capability in many AID-assisted LAC countries brings us to the next higher level concern being addressed by most LAC USAID Missions: whether the Missions should renew or place greater emphasis in their programs on strengthening public sector Ag REE organizations. A related question is whether Missions should continue to support project structures for carrying out research or should return to a traditional "institution building" emphasis. As USAID/Honduras asked: "Should the Mission continue to support projects carried out by poorly organized and administratively weak public sector entities or should the Mission place its resources in a program to assist in reforming and restructuring Ministry organization and service delivery mechanisms?"

Questions such as these are now coming to the fore because of increasing recognition that the private sector cannot be expected to do everything that is needed with respect to agricultural TG&T, that there is a role for the public sector to play in agricultural TG&T, and that a disabled public sector TG&T capability cannot adequately continue to address problem areas where there is no incentive for the private sector to place scarce R&D investment resources at risk.

Even where maximum impact can be achieved only by public and private sector collaboration, USAID/Ecuador noted that this is feasible only if "all...parties, including the public sector, are involved and working together to identify problems, test solutions, and extend new knowledge and technologies to producers." *But, for most LAC USAID Missions, any possibility of increased funding to assist the public sector in developing its capability to work with the private sector will depend on the host country government demonstrating a commitment to rebuild Ag REE institutions.*

The second-highest level of concern on the hierarchy expressed by several Missions is how to address Ag REE-strengthening in the face of the dwindling availability of development assistance resources. As USAID/Honduras asked: "How can the Mission maintain a well-rounded agricultural portfolio which addresses these and other sector issues in the face of dwindling DA and ESF funding?" As an example, USAID/Bolivia noted that there was an absence of in-house expertise, in the Ag REE area; yet lacking such expertise the Mission is under pressure to articulate a detailed "alternative development" strategy.

The highest level of concern relates to the problem of articulating a strategy that is commensurate with the magnitude of the problems; in effect, a strategy that addresses all of the lower levels of concern on the hierarchy. As USAID/Perú noted, "strategy development appears to be the most elusive element," with politics playing an important role in any initiative's success or failure. Indeed, as the ROCAP Mission noted, AID's development assistance "will hinge on the willingness of the regional governments to reform their macroeconomic and sectorial policies." Further, the Mission noted the need for study and analysis of the factors and/or requirements for "building a coherent...agricultural science, technology, and higher education system."

In summary, the identified hierarchy of concerns is as follows:

1. The importance of agriculture in the economy (both as a percentage of GDP and as compared with other concerns such as natural resource management).
2. The importance of lack of agricultural TG&T capability as a constraint on agricultural economic growth.
3. The relative importance of NTAE crops vs. traditional food crops (and other commodity groups such as livestock, traditional export crops, and import substitution crops).
4. The respective roles of public and private sector agricultural TG&T.
5. How to address the need for Ag REE-strengthening in the face of dwindling development assistance resources.
6. Identification of a strategy that addresses all of the lower level of concerns on the hierarchy.

6. Non-project Assistance

The concept of using non-project assistance for strengthening Ag REE has been proposed by Brown (1990c), although Brown refers to this concept as Non-project Sector Assistance (NPSA). In the Andean region, the concept is being explored by USAID/Ecuador, but USAID/Bolivia indicated that it is not considering this concept. While USAID/Perú recognized the importance of non-project assistance as a funding source, the Mission indicated that using such funds to stimulate change in the level of public resources allocated to Ag REE institutions is "questionable." The Mission voiced concern that using project funds to cover operating expenses of Ag REE institutions would "deplete any project funds and severely weaken the effects of...any such project." If this is the reason why the

Mission feels that non-project assistance for Ag REE-strengthening is "questionable," it may indicate that there is not an adequate understanding of the non-project assistance concept as applied to a specific agricultural subsector (i.e., Ag REE as a subsector of the agricultural sector).

Generally, with the exception of USAID/Honduras, Caribbean and Central American USAID Missions are not considering the possibility of non-project assistance as a vehicle for Ag REE-strengthening in their regions. For these Missions, Ag REE is only one of a number of areas that may be addressed in Mission policy dialogue with the host country. In some cases, the concept has less immediate potential relevance. Such examples would include Haiti, where the USAID Mission currently has no bilateral projects; in Belize, where the Mission does not have ESF funds for these purposes nor does it have a PL-480 program which could provide resources for a NPSA program; or in Costa Rica, where the Mission reported that Ag REE is not a priority area.

For several countries, particularly Jamaica, El Salvador, Guatemala, and Honduras, ESF and/or PL-480 funds provide funding for Ag REE activities. For example, in Guatemala, a greater allocation of public resources for supporting ICTA is part of ongoing ESF negotiations. USAID/Honduras was developing a non-project assistance program ("Agricultural Sector Adjustment Program") to influence a wide variety of sector policies. This program was expected to have a significant impact on public sector resource allocations for agricultural research, extension, and education. The Mission indicated that its agenda is clearly directed at achieving policy reforms by developing a sectoral program that will incorporate ESF, DA, and PL-480 resources in a program combining structural adjustment and specific project-type activities. The program was to work toward improving not only the allocation of resources to Ag REE but also on how REE activities are carried out. However, the program was not implemented.

7. Opportunities to be Pursued

The Missions reflect varying perceptions with regard to whether Ag REE is a target of opportunity for AID. In some cases, the Missions feel that other donors should support other improvements (e.g., infrastructure), with AID focusing on strengthening Ag REE. Yet other Missions (e.g., Guatemala and Honduras) indicated that other donors could play a more active role in strengthening public sector agricultural research and extension. RDO/C and ROCAP both encouraged wider donor support of regional Ag REE institutions (e.g., CARDI and CATIE).

The often ambivalent attitude of LAC USAID Missions toward Ag REE-strengthening leaves one with the impression that this is an area much like the weather: everyone talks about it but nobody does anything. But in a world characterized by an increasingly interdependent global economy, AID-assisted LAC countries cannot afford to be without at least a minimal level of TG&T capability in agriculture. Each country must develop some level of public and/or private capability to carry out TG&T. Each country's Ag REE organizations, be they public, private, or a combination of both, have a role to play in contributing to the development of the country's TG&T system.

The issue facing each LAC USAID Mission, as well as LAC/DR/RD, is deciding whether and how AID should collaborate in providing support to those countries that seek to strengthen their Ag REE systems. This area merits additional consideration by and discussion within AID, particularly as LAC/DR/RD seeks to develop the LAC Agriculture and Natural Resources Strategy. The following two chapters introduce several concepts and potential assistance options to stimulate such consideration and discussion. Chapter VI focuses on the concept of demand-driven Ag REE systems, while Chapter VII identifies potential assistance options that AID should consider if the Agency wishes to prevent continued deterioration of Ag REE systems from becoming a constraint on widespread economic growth in the LAC region.

CHAPTER VI
DEMAND-DRIVEN AG REE SYSTEMS

This chapter focuses on the concept of a demand-driven Ag REE system—the need for a demand-driven agricultural technology generation and transfer (TG&T) system; essential conditions for establishing a demand-driven Ag REE system; and the research, extension, and education functions essential for carrying out agricultural TG&T within an Ag REE system, whether public, private, or a combination of these. The chapter provides a key conceptual foundation for suggesting, in chapter VII, some assistance options that AID should consider if the Agency wishes to prevent continued deterioration of LAC Ag REE systems from becoming a brake on economic growth in the region.

A. Need for Demand-driven Agricultural TG&T

There continues to be a need for increased farmer productivity in traditional and nontraditional export crops as well as in traditional subsistence and import substitution crops. A potential explanation for this is the low productivity of agricultural TG&T systems in the region, particularly within the public sectors of most AID-assisted LAC countries. Typically public sector TG&T systems have been plagued by:

- A failure of national leadership to recognize the potential importance of agriculture to a country's economic and social well-being; the role of TG&T systems in increasing the productivity of a country's agriculture; and the role of the Ag REE system in raising the productivity of the TG&T system.

- A failure to provide potential beneficiaries of agricultural research, in particular, farmers knowledgeable about production and marketing constraints, effective participation in the process of identifying the problems on which research is needed, establishing research agendas (i.e., setting priorities for research), and allocating research resources.

- A failure to commit the financial and human resources needed to be able to develop productive Ag REE system, with key research and extension positions in public sector TG&T systems often filled by persons having qualifications that are more political than technical.

These problems are well-known and persist, yet AID development assistance all too often has continued to rely on a supply-oriented approach aimed at capacity building (see Box 6.1) or developing the technical capability of national agricultural research and extension organizations to carry out TG&T activities, without paying adequate attention to more basic policy and institutional constraints to productive TG&T (e.g., failure to allocate adequate

Box 6.1.The Rise and Fall of a Supply-driven Concept of TG&T in the LAC Region.

The concept of supply-driven TG&T in the LAC region can be traced to before World War II, with agriculture being a prime target for the model's application. As Vessuri (1990:1544) observed:

> "Theories of economic progress were common in the region before World War II. During the 1930s and 1940s, a few scientific leaders advocated government support of fundamental research, usually on a shared basis with international donors, as a means of constructing scientific communities and economic development, which were assumed to be causally linked.... The aim was to form a 'scientific-technical' infrastructure, assuming, often implicitly, that on reaching a critical mass there would be an automatic reinforcement of local technology.... This would increase both production and productivity. The stage for public science and technology policy was set in the 1950s, and its most vocal advocates were leading figures from the academic scientific community.
>
> "The national elites in academic science, generally with the technical-ideological help of international agencies, managed to convey to several Latin American governments and social leaders the view that there was a linear, one-way flow of ideas from fundamental research through development to commercial or operational application. The model was appealing because it was simple to interpret and transmit. For many years, nobody contradicted this model of the genesis of technological innovation.... In the real world, however, things did not function according to such a simple, elegant picture. In practice, this scheme helped to increase the number of higher education and research institutions, as well as the number of researchers. However, the scheme was unable to reinforce local technology, which remained incipient and continued to complement imported technology, without much influence on the productive structure."

resources to carry out agricultural research). Indeed, the presence of any of these constraints reflects that the system has not yet been structured to allow potential beneficiaries to demand an Ag REE system having the technical capability to carry out productive agricultural TG&T.

In short, the problem may not have been the result of any lack of ability or willingness to supply more productive technologies; rather it may result from constraints on the demand for technology. Often these constraints, as ROCAP's Non-Traditional Agricultural Export Promotion (PROEXAG) project has demonstrated, lie not in a lack of supply of agricultural technology but rather in a lack of effective demand for technology. Once PROEXAG had assisted potential growers of nontraditional agricultural export (NTAE) crops (e.g., melons) to link up with potential U.S.-based importers of these crops, a link was established between Central American growers and a market with a demand for crops which those growers could supply. The market's requirement for crops to meet certain quality standards created a demand on the part of growers for improved production, pest management, and postharvest handling technologies. It also created an incentive for private sector receivers (e.g., importers) to assist growers in acquiring the required technology or undertaking the adaptive research needed (Byrnes, 1989).

This demand-driven TG&T process needs to be supported and cultivated if the gains in production and productivity of NTAE crops are to be maintained and expanded. But this demand-driven or market-led dynamic must also be activated in the farming sectors that supply subsistence food (e.g., maize), import substitution (e.g., onions), or traditional export (e.g., cacao) crops to local, regional, and/or export markets. This requires greater participation by agricultural producers in identifying research problems, setting research agendas, and allocating research resources. Such producers are the clients and potential market for agricultural technologies generated by research and transferred by extension. Only such producers can adopt improved technologies having the capability of increasing yields, raising incomes, and increasing agricultural production and marketing revenues. Only by channeling a portion of such increased revenues back into the agricultural TG&T process can a country develop self-sustaining Ag REE institutions.

But rather than developing a market-led approach to TG&T, donors such as AID have continued to pursue supply-oriented (i.e., "capacity building") approaches, largely based on the assumption that the principal constraint to increased agricultural productivity was a lack of productivity-increasing technology, and that the key missing ingredient to effective TG&T was "capacity building." Yet the major constraint may actually have been the lack of effective demand for improved technology and the installed capacity that would be needed to generate and transfer this technology to farmers.

As a result, donors such as AID have tried for years to push a basically "capacity building" or "technological" fix, without ensuring that there is adequate or sufficient demand for the "fix." When project interventions did not live up to expectations, evaluation teams identified numerous "process" factors that impeded counterpart research and extension organizations, almost always public sector entities affiliated with a Ministry of Agriculture, from implementing effective TG&T. These identified "process" factors were basic institutional constraints to carrying out agricultural TG&T through public sector Ag REE organizations. But AID and other donors generally have failed to admit the full impact of such institutional constraints, or have not been able to devise a way to remove or relax them.

An often identified constraint has been the failure of the national government to meet counterpart operating expense budget commitments. The explanation for this failure often has been that governments lack adequate resources or fail to understand the importance of agriculture, when in fact the real reason for not allocating resources to agricultural research was the failure to involve constituencies having effective power to pressure the government to allocate to agricultural research a share of the public purse commensurate with agriculture's potential or even actual contribution to the national well-being.

Over the years, donor patience began to wear thin. During the 1980s, AID began to cut back on development support for public sector Ag REE in the LAC region. In some cases, USAID Mission project support for TG&T was completely terminated (e.g., ATD and ATT in Panamá), while support was significantly reduced in others (e.g., ICTA, Guatemala). Further, LAC USAID Missions began to pursue a policy of redirecting support for agricultural research from the public to the private sector (e.g., FHIA in Honduras and FUNDAGRO in Ecuador). However, this redeployment of funding support only further

weakened TG&T capability, especially in smaller countries facing a dual TG&T need—to earn foreign exchange via production and sale of traditional and nontraditional agricultural export (NTAE) crops; and to meet food security targets for subsistence food crops.

In retrospect, the LAC USAID Mission response (i.e, reducing project support to public sector agricultural research and extension) was inappropriate, if the real constraint to farmer adoption of improved technology was not any lack of ability to supply productivity-increasing technology but rather the lack of demand for the technology. If this is the case, then better understanding of actual or projected demand for a crop (e.g., the constraints on local and regional markets for subsistence food crops) potentially could play an important role in identifying strategies and programs to stimulate demand for these crops and, in turn, demand for technologies to increase efficiency in the production, postharvest handling, and marketing of these crops.

Specifically, a better understanding of the market demand for a crop as well as the production and marketing constraints facing producers of that crop would provide essential data for determining whether research should be carried out on that crop and, if so, what research would have the greatest likelihood of producing technology that farmers would demand (i.e., adopt) as well as the increased revenues that could provide a sustainable basis of support for the Ag REE system to carry out TG&T on that crop.

Given these factors, as well as the many encouraging changes (e.g., improved terms of trade for agriculture) now occurring in the macroeconomic and policy environments of many countries in the LAC region, the time may be propitious for AID to assess whether a more market-led, demand-driven, and client-oriented approach to Ag REE-strengthening could play a major role in activating TG&T systems capable of generating technologies having strong actual or projected market demand. Such an approach would place due emphasis on strengthening those parts of a country's overall Ag REE system that are constraints on agricultural TG&T. The approach would not be based on the assumption that each country should have or cannot afford to be without an all-encompassing Land Grant-type REE institution. Rather it would be based on the concept that each country must identify it own strategy for coordinating the provision of essential REE functions, whether they are provided by public or private organizations, and whether they are located within that country or elsewhere.

B. Conditions for a Demand-driven Ag REE System

The demand for an Ag REE system is a "derived" demand, that is, one deriving from the agricultural sector's demand for productivity-increasing technologies for the production and marketing of agricultural crops. If there is demand for agricultural technology generation and transfer (TG&T), there will also be a demand for an Ag REE system to generate the technology that agricultural producers demand, to transfer this technology to those producers, and to educate the agricultural specialists needed by the Ag REE system (researchers, extensionists, and educators) and the agricultural sector in general (agribusiness technicians and managers).

However, in many if not most AID-assisted LAC countries, the demand of agricultural producers for agricultural TG&T and in turn, a productive Ag REE system is often an unarticulated demand. Farmers, particularly traditional subsistence and even small commercial farmers, have no control over a country's macroeconomic policies that often are detrimental to the agricultural sector. As a result, there is little or no incentive to invest in the agricultural inputs (e.g., seed, fertilizer, irrigation systems, etc.) required to adopt and use productivity-increasing agricultural technologies, assuming that such technologies are even appropriate to such farmers. Also, these farmers have little or no control over their access to key agri-support factors such as market, credit, and land (Byrnes, 1985). Generally, the agricultural policies of many countries in the LAC region are stacked against the rural, agricultural sector and in favor of the urban, industrial sector. A concrete result of this bias is that public sector budget allocations for Ag REE institutions are disproportionately low compared with agriculture's potential or even actual contribution to the general economy.

Yet there is a potential role which the Ag REE system can play in AID-assisted LAC countries in helping to create a supply of and demand for productivity-increasing agricultural technologies and the TG&T systems that produce and make these technologies available to farmers. In their theory of induced institutional innovation, Yujiro Hayami and Vernon Ruttan (Ruttan and Hayami, 1984:211, 217-218) point to the potential role that private sector farmer organizations can play in creating a demand for agricultural support institutions that effectively reduce constraints to TG&T. Their research findings demonstrate that technological change in any given agricultural situation will likely depend on implementing a mix of technical and institutional reforms that reallocate resources "so as to remove those resource constraints that are most inelastic and those institutional constraints that are most restrictive to growth and development" (Ruttan, 1978:413).

Addressing the question of which types of technical and institutional reforms are required for technological change in developing country agriculture, Hayami and Ruttan (1984:56) cite Grabowski's (1981) statement that, in addition to developing a variety of agricultural research activities, there is a need for:

> an increase in power and influence of farmers with small farms, relative to those with large farms, on government decisions concerning agricultural research and credit priorities. This could possibly be accomplished through land reforms or, a less radical solution, *the organization of small farmers into groups which could put pressure on government agencies to recognize and respond to the interests of small farmers"* [emphasis added].

While Hayami and Ruttan (1984:56) assert that such technical and institutional reforms are "clearly desirable", they ask: "But what are the *conditions* that make them [the clearly desirable reforms] economically and politically viable [emphasis added]?"

There is increasing evidence that emergence of a market-led or demand-driven Ag REE system depends on establishing two *conditions*: (1) increased involvement of the private sector in designing, implementing, and evaluating TG&T activities carried out by Ag

REE institutions; and (2) leveraging institutional change in the public sector (e.g., autonomy of public agricultural research organizations and increased budget support). Establishing these conditions is essential if Ag REE systems, especially public Ag REE organizations, are to carry out client-oriented, demand-driven, and market-led agricultural TG&T successfully, that is, agricultural research and extension that is responsive to market opportunities and the technological needs of farmers.

Specifically, for market-oriented TG&T to occur, Ag REE institutions, such as a public sector agricultural research organization (PSARO), must develop research program selection criteria that include *inter alia*: (1) the anticipated market environment and expected cost/benefit of program alternatives; (2) the relative importance of crops within and among commodity groups, (e.g., basic food crops vs. NTAE crops); and (3) the specific needs and capabilities of client groups (e.g., small traditional vs. medium-to-large mechanized farmers). The need to take different client groups' needs and capabilities into account when organizing an agricultural TG&T system is highlighted in a recent report by Kaimowitz and Vartanián (1990) on strategies for technology transfer for Central America. They propose a typology that disaggregates conventional technology transfer strategies as a function of the following research beneficiary categories:

- Large mechanized producers;
- Growers of nontraditional agricultural export crops;
- Small and medium sized farmers using the land intensively;
- Agricultural frontier farmers;
- Medium and large sized cattle ranchers;
- Marginal farmers; and
- Agrarian reform farmers.[1]

Each category delineates a particular group of farmers that has its own characteristics and technological problems which, in turn, have implications for the type of public or private entity that is in the best position to provide institutional support for technology transfer. But this concept also may be extended to identifying the type of public or private entity that is in the best position to provide institutional support for technology generation responsive to the technology needs of specific client groups. A preliminary typology to define a client-oriented TG&T strategy for each client group is presented in Table 6.1. The TG&T strategy appropriate for each beneficiary group also has implications for the mix of public and/or private financing that will be required to sustain TG&T for that beneficiary group.

In other words, the mix of public and/or private financing that is needed to sustain TG&T for nontraditional agricultural export crops (e.g., melons) is very different from the financing mix required to sustain TG&T for traditional food crops (e.g., corn). Generating

[1]Kaimowitz and Vartanián note the somewhat arbitrary nature of this typology. For example, more than seven groups could be identified. Some producers could be classified into two groups or could find themselves in an intermediate situation among two or more groups. Among the more significant groups not included as distinct cateogries in the typology are medium and large sized coffee growers, the banana companies, and indigenous communities.

Table 6.1. Typology of Producers for Defining a Client-Oriented TG&T Strategy (Adapted from Kaimowitz and Vartanián, 1990:48).

Beneficiary Category	Technological Problems	Institutional Locus for TG&T Support	Technology Transfer Focus
Large mechanized producers	Reduce costs sustainability	Parastatal or private, by crop; producer associations	Individual technical assistance and programs by crop
Growers of nontraditional export crops	Learning how to grow new crops, quality, postharvest handling	Private technical assistance; private agricultural research foundations; universities	Vertical integration and support to groups by crop; individual assistance with adaptive research
Small and medium sized producers using the land intensively	Yields at low cost, pests and diseases, agroindustry	MOA & Research Institutes, supervised credit, coffee institutes, CATIE	Farming Systems Research & Extension; rural communication plans
Agricultural frontier farmers	Sustainability	Few: colonization institutes and natural resource agencies	Not defined
Medium and large-sized cattle ranchers	Intensify "alimentación de verano"	Producer associations; financial sector; private technical service	Supervised credit; individual technical assistance
Marginal farmers	Low cost technology, sustainability, new souces of income	Rural development projects; nongovernmental groups (NGOs) & private voluntary organizations (PVOs)	Incorporating TG&T as part of agricultural development projects
Agrarian reform farmers	Management and organizational improvements	Agrarian reform institutions and campesino organizations	Organization and training of farmers in TG&T

most agricultural technology for subsistence or basic food crops is a public good, the benefits of which accrue to thousands of farmers and millions of consumers who cannot perform this function in a cost effective way. Thus, for such research, public revenues finance a public sector institution to perform this function. By contrast, the private sector funds agricultural research having a high probability of leading to the development of products (e.g., seeds) that embody the improved technology and that can be sold to farmers. The private sector finances agricultural research through the profits recovered by selling products that embody the technology developed through agricultural research. Similarly, society recovers the cost of public sector investments in agricultural research on basic food crops through the increases in farmer income and reductions in consumer food bills made possible by TG&T that leads to farmer adoption of yield-increasing crop production technologies.

If this is the case, what role can donor agencies such as AID play to stimulate coordinated and sustained public and/or private sector funding for each identified beneficiary group? Other important questions will also need to be answered in each country case, including: What arrangements for developing research program selection criteria will ensure that the criteria reflect good science, producer and consumer welfare, and national development needs? How can the criteria be applied to selection or rejection of activities and their subsequent evaluation?

C. Functions of a Demand-driven Ag REE System[2]

Having identified key conditions for establishing a client-oriented or demand-driven TG&T system, this section outlines the research, extension, and education functions that are carried out in such a system. Of course, given that the essential conditions specified in the preceding section have been established, each country yet must determine how these system functions—research, extension, and education—are to be provided and coordinated for each client or beneficary group, and how these functions are to be financially sustained from public and/or private sources.

1. Research

The responsibility of this function is to acquire or generate technology with the potential to alleviate constraints to the production and/or marketing of crops having current or projected market demand *and* adapting this technology, through experiment station and on-farm research, to the ecological and cultural conditions under which the technology is to be used. Research is a highly technical operation requiring leadership by well-qualified professionals, with postgraduate specialization to the Ph.D. level or equivalent experience. Implementation of the research function normally involves a mix of public and private participants, including a public sector research organization, private sector product-oriented research, and academic (discipline-oriented) research within a university. All three types of research are essential.

[2]This section draws draws heavily on a concept paper prepared by Scaff Brown (1990c).

a. Public Sector Research

As previously noted, development or validation of most agricultural technology for subsistence or basic food crops is a public good, the benefits of which accrue to thousands of farmers and millions of consumers who cannot perform this function in a cost-effective way. Generally, public revenues finance a public sector institution to carry out TG&T for basic food crops. The wide range of agricultural research programs underway at International Agricultural Research Centers (e.g., the International Rice Research Institute in the Philippines) provide an example of such public sector research at the international level. However, the majority of public sector research is carried out within individual countries (e.g., EMBRAPA's research programs in Brazil), although there are also examples of public sector regional agricultural research centers: the Tropical Agricultural Research and Training Center (CATIE) in Costa Rica and the Caribbean Agricultural Research and Development Institute (CARDI) in Trinidad.

b. Private Sector Research

Considerable technology is developed by private firms, motivated by the potential profit from its sale. For such technology research to be profitable, the costs of carrying out the research plus any profits to be earned must be recovered through sale of the technology in the market. If private sector entrepreneurs do not see any potential profit to be made by investing in research to develop technology, they will invest their resources elsewhere. Recovery of the costs incurred in carrying out research to develop new technology is facilitated when the technology is embedded in a salable product (e.g., livestock, semen, machinery, seed, fertilizer, pesticides, irrigation equipment) or related services. Private firms investing in agricultural research also may benefit from basic, applied, or adaptive research performed by the public sector; they and their farmer clients also benefit from technology validated through public sector adaptive research and extension such as site-specific varietal trials carried out by public sector extension agents.

c. Academic Research

Research carried out within agricultural colleges and universities is highly complementary to public and private sector research, and is essential to scientific education. It provides a cost-effective way to utilize scarce talent to solve agricultural problems. Professors who perform good research must keep current in their field, and are better able to guide students. Student research provides vital laboratory and field experience, and an opportunity to absorb the discipline and curiosity of the scientific method, useful in subsequent professional employment, whether working as a farmer, agricultural researcher, agricultural extensionist, or in another agriculturally-related occupation.

2. Extension

Transfer of research-generated technology to farmers, and their decision to use such proffered technology, is a complex process that is carried out via a mix of communication methods. Often these methods are performed by public sector institutions,

including formal extension services and extension specialists in other organizations; private sector banks; input supply houses; purveyors of technical assistance; processors of agricultural products; private voluntary organizations (PVOs); and universities. Each organization has its own motivation and client focus, which frequently overlap. But the overlap is not without value. The decision to adopt a technology is based on the farmer's incentive, not on that of the extension organization recommending the technology to the farmer. The farmer's decision to use a technology is often based on information received repeatedly from multiple sources (experience, field research and/or extension participation, and other farmers' experience with the technology).

It is a proper, and indeed vital, responsibility of public research organizations to provide research results, in readily useable form, not only to other investigators, but to all types of organizations in a position to carry out follow-on, more site-specific adaptive research and technology transfer (the extension function) vis-à-vis potential users of the technology. Where the technology in question has been developed by the private sector, the research results are proprietary and accordingly little or no dissemination will occur if this potentially would be damaging to the firm's competitive position in the marketplace.

3. Education

Science-based agriculture is a highly complex, technically oriented subject. The effective performance of research, extension, and education all require well-educated professionals, trained in applying one or more of the earth, physical, biological, and socioeconomic sciences to agricultural production and marketing. Agricultural faculties are responsible for implementation of the education function. To fulfill this responsibility, such faculties must be staffed with professors who are far better prepared than their own students, who are kept current in their fields by personal research, and who have an understanding of farmer practices and needs through direct field work with farmers. Their students need opportunities to conduct supervised research and extension, and to gain practical experience in both field and laboratory science and in communicating with other researchers, extensionists, and farmers.

D. Implications for a Demand-driven Ag REE System

Any Ag REE system that is to be self-sustaining, particularly in an increasingly competitive and interdependent global economy, must provide for coordinated provision of these key REE functions, including: (1) public, private, and academic research; (2) extension or technology transfer, whether through public or private organizations; and (3) education. A country does not necessarily need an all-encompassing agricultural research, extension, and education organization (e.g., a Land Grant-type university) in order to secure coordinated provision of these functions in a productive and timely manner. Indeed, where a country is very small or has extremely limited resources, it would not make economic sense to attempt to create such an all-inclusive organization to serve that country's limited research, extension, and education needs, since the potential returns could be very small relative to high fixed and variable costs involved in establishing and sustaining such an organization.

It would be extremely impractical for a small country such as Belize or a resource-poor country such as Haiti to attempt to establish a national agricultural research system such as exists in large or resource-rich countries like Colombia, Brazil, or Mexico. But if their agricultures are to become more productive and competitive, small countries must provide for coordinated provision of the research, extension, and education functions needed to alleviate existing technological constraints to the production and marketing of crops on which their economies and social well-being are very much dependent. Further, the Ag REE functions must be organized and provided in a coodinated way responsive to actual or potential market demand and client circumstances, in order to ensure that agricultural TG&T will produce technologies that are in demand and will be adopted by farmer beneficiaries.

What role can a USAID Mission play in assisting the Mission's host country to develop the essential conditions for a client-oriented, demand-driven, and market-led Ag REE system? Possible assistance options for AID consideration are presented in Chapter VII.

CHAPTER VII
POTENTIAL ASSISTANCE OPTIONS FOR AG REE-STRENGTHENING IN THE LAC REGION

In the 1980s a serious deterioration occurred in the TG&T capacity of LAC Ag REE systems. During this period, there was continuing inability and/or unwillingness on the part of national governments in many AID-assisted LAC countries to provide adequate support for TG&T carried out by public sector Ag REE institutions. It became increasingly difficult for AID to justify support for projects aimed at public sector Ag REE-strengthening. Further, there was a decline in the availability of Agency development assistance (DA) funds, as well as increased earmarking of these funds for other priorities. These trends made it increasingly difficult for LAC Missions to fund projects tailored to Ag REE-strengthening needs in the Missions' host countries.

LAC countries that are small and/or resource poor do not have the same incentive to establish national Ag REE systems of the type justifiable in larger and/or resource-richer countries (e.g., Colombia, Brazil, or Mexico). Funding of Ag REE projects to establish full-scale Ag REE systems in small or resource-poor countries would not be cost-effective. Yet these countries must be able to access and adapt the productivity-increasing technologies needed to meet their food and income needs. If the trend of deteriorating TG&T capacity in the LAC region is left unchecked, the continued failure to address the need for Ag REE-strengthening could become a serious brake on achieving broad-based economic growth in the region.

There is clearly a need for AID to address this problem and to identify potential assistance options that would help in ensuring that broad-based economic growth in the LAC region is not precluded by a failure to strengthen the region's Ag REE systems. Some potential assistance options include the following:

- Ensure that Ag REE-strengthening is adequately prioritized in the LAC Agriculture & Natural Resources (ANR) Strategy;

- Reorient existing and planned projects to follow guidelines for Ag REE-strengthening that are more consistent with the concept of a demand-driven Ag REE system;

- Ensure an appropriate balance of AID funding for international, regional and national agricultural research centers or systems;

- Provide appropriate technical support through existing or new regional or subregional projects or funding mechanisms;

- Organize development assistance programming for Ag REE-strengthening in terms of subregional programs.

A. Potential Assistance Options

1. Ensure that Ag REE-strengthening Is Adequately Prioritized in The LAC Agriculture & Natural Resources (ANR) Strategy

At the time the present study was nearing completion, the LAC Bureau was carrying forward a process to develop the LAC Agriculture & Natural Resources (ANR) Strategy. While the draft ANR strategy, available as of this writing, includes priority areas, strategic options (objectives), and needed actions that relate to Ag REE, the final strategy's content was not yet determined. Given that the draft strategy is precisely that (i.e., a draft subject to change), what needs to be emphasized is the longer-term issue of how the LAC Bureau can determine what priority to set on committing scarce resources to the goal of Ag REE-strengthening in the LAC region.

Bruce F. Johnston (1991) notes that while the recent literature on agricultural development has focused on "getting prices right," the more basic question of "getting priorities right" has received relatively little attention. Clearly, policy-induced "macro price" distortions in exchange rates, interest rates, wage rates, and subsidized food prices can be a constraint on agricultural development. But such price-related distortions may only be a minor constraint. In the long run, as Johnston (1991:81) notes, "macroeconomic reforms can never be a substitute for the policies and programs needed to foster agricultural development."

Citing Roemer and Radelet (1989), Johnston proposes that a complete reform package would contain five components:

> (1) freeing markets to determine prices ("letting markets work"); (2) adjusting controlled prices to scarcity values ("getting prices right"); (3) shifting resources from government into private hands (privatization); (4) rationalizing government's remaining role in development (budget rationalization); and (5) reforming institutions to carry out government's new role (as cited by Johnston, 1991:82).

The key to such a reform package is to achieve a better institutional balance of responsibilities between public, private, and voluntary sectors, with the public sector's role becoming that of creating an "enabling environment," particularly by "strengthening the provision of public goods such as education and agricultural research..." (Johnston, 1991:82).

While there are many potentially important components of an "enabling environment," the critical problem is to avoid committing scarce resources to interventions that are not of strategic importance; indeed, it is the need to maintain a balance between governmental responsibilities and resources that dictates the necessity of defining strategic priorities. Johnston (1991:82) proposes that development planners (e.g., AID officials) "can adopt

strategic priorities...to accelerate the transformation of [developing] economies and the eradication of poverty." Further, he suggests that it is possible for countries such as those assisted by AID to make "useful generalizations...about...strategic priorities...which help to identify the kinds of policies, programs, and projects that are likely to be appropriate" (Johnston, 1991:83).

Further, if possible, "decisions should be based on quantitative estimates of the benefits and costs of the relevant alternatives" (Johnston, 1991:84). In any case, a measure of consensus on strategic priorities is required in order to identify a limited, and manageable, number of options worthy of quantitative analysis. However, he continues:

> many of the critical decisions about strategic priorities cannot be based on quantified estimates of benefits and costs. Many key variables are extremely difficult or impossible to quantify but too important to ignore.... An attempt to apply rigorous optimization or other quantitative techniques to a subset of variables is likely to be worse than decision making that is guided by a more comprehensive attempt to take account of all of the significant variables. That is especially true of the long run in which technology and resources are variables that depend on which historical paths were chosen at successive earlier periods.... Even with heroic efforts to quantify costs and benefits of alternative actions, policy makers can only have a notion of the policies and programs that will be effective in furthering the development process (Johnston, 1991:84, 92).

Allowing development planners and policy makers to make choices about development paths or priorities is the basis for the concept that "strategic notions" play a crucial role in formulating a development strategy to deal with the diverse problems facing developing countries. As Johnston (1991:90-91) states, for the developing countries "no sustainable solution to their pervasive problems of hunger and poverty is possible without structural transformation and substantial increases in farm and nonfarm productivity and output." Thus, the need for public and private investment and recurrent expenditures for economic and social development is:

> so great that it is exceedingly difficult for late-developing countries to maintain a manageable balance between responsibilities assumed by government and the resources available for carrying out those responsibilities. That common problem of imbalance between responsibilities and resources underscores the critical importance of achieving a workable consensus with respect to development priorities (Johnston, 1991:91).

Johnston proposes that "strategic notions" can facilitate planners and policy makers in reaching a consensus on strategic priorities. He notes in this respect that:

> Study of the historical experience of countries in which well-conceived agricultural strategies have made a major contribution to economic growth suggests that certain strategic notions held by policy analysts and policy makers facilitated a consensus on strategic priorities. In both the U.S. and Japan, for example, widely held strategic

> notions concerning the importance of education and investing in human resources contributed greatly to their economic progress (Johnston, 1991:91).

Indeed, with specific reference to the issue of Ag REE-strengthening, the literature on both Japan and the U.S. indicates:

> that several strategic notions helped to shape the development of an interacting system of developmental institutions, including primary and secondary schools and institutions of higher education, agricultural research systems, mechanisms for diffusing technical knowledge and innovations, and programs for construction of roads and other rural infrastructure. The increasingly productive agricultural technologies that were developed and diffused in the two countries were very different but well suited to their respective resource endowments (Johnston, 1991:92).

These considerations lead Johnston to the "strategic notion" that, given the structural-demographic characteristics of a late-developing country (see Box 7.1), policies and programs that foster progressive modernization of a country's small-scale farm units will have important advantages in terms of both efficiency and equity.

Adoption of this "strategic notion," Johnston suggests, should facilitate policy makers in achieving consensus on six strategic priorities (see Box 7.2); "if policy makers can reach a consensus on these strategic priorities, then they can achieve structural transformation in an accelerated time period" (Johnston, 1991:96).

Box 7.1. The Small Farmer Cash Income/Purchasing Power Constraint.

Johnston (1991:93) points out that "the structural-demographic characteristics of a late-developing country...severely constrain sector-wide expansion in the use of 'external' purchased inputs.... It is only when structural transformation is well advanced, so that farm labor becomes scarce and expensive and reliance on labor-saving farm machinery becomes socially as well as privately profitable, that economies of farm size become important." He also notes "the severe cash income/purchasing power constraint that characterizes the agricultural sector in late-developing countries. That constraint exists because the urban population dependent on purchased food is very small relative to the number of farm households. Hence a subsistence orientation is an inevitable characteristic of farm households.... The initially slow process of structural transformation will only gradually increase cash receipts as domestic commercial sales expand with growth of the nonfarm population dependent on purchased food. As the rate of growth of a country's total labor force declines and the weight of the farm labor force in the total is reduced, the scope for enlarging the cash receipts of the average farm household is increased. Because that is inevitably a slow process, expanded production of export crops is likely to be an attractive option for late-developing countries because it provides a means of expanding farm cash receipts that is not dependent on the slow process of structural transformation.... The cash income/purchasing power constraint and other factors...make it <u>virtually</u> <u>impossible</u> for a late-developing country to implement simultaneously successful strategies oriented toward both smallholders and large-scale farm enterprises" (Johnston, 1991:87-88).

Box 7.2. Six Strategic Priorities for Achieving Sustainable Economic Growth in the LAC Region (Johnston, 1991:94-96).

1. Give priority to government's facilitating and catalytic role while minimizing the role of public agencies in commercial or productive activities.

2. Avoid macroeconomic policies that have adverse effects on agricultural development generally and especially on small-scale farmer units.

3. Face up to the fundamental importance of pursuing an agricultural strategy that leads to a broadly based, unimodal pattern of agricultural development rather than a dual-size structure of farm operational units and a bimodal pattern of development with the two subsectors using drastically different technologies.

4. Expand and improve the rural infrastructure to serve agriculture and rural nonfarm enterprises.

5. Improve systems of agricultural taxation, including steps to reduce the disincentive effects associated with the de facto taxation of farmers by an overvalued exchange rate and/or low prices determined by governmental policy.

6. Undertake certain direct but highly selective measures to enhance rural welfare by increasing per capita investments in human capital in the form of education and health.

With respect to the question of the priority that the LAC Bureau should place on Ag REE-strengthening in the Agriculture & Natural Resources Strategy, the third strategic priority listed by Johnston points to the importance of:

> minimizing reliance on the capital-using, labor-saving technologies favored by large farm units while strengthening research programs which generate *divisible* innovations capable of being used efficiently by smallholders subject to a cash income/purchasing power constraint.... Experience with the Green Revolution in Asia and earlier experience in Japan, Taiwan, and Korea demonstrate that it is considerably easier to generate innovations that are neutral to scale, notably improved seed-fertilizer combinations, under irrigated conditions than with rainfed agriculture (Johnston, 1991:95).

When applied to AID-assisted LAC countries, Johnston's argument implies that the final LAC ANR strategy should place a high priority on Ag REE-strengthening.

2. Reorient Existing and Planned Projects to Follow Guidelines for Ag REE-Strengthening that Are More Consistent With the Concept of a "Demand-Driven" Ag REE System

Based on the present study's inventory of Ag REE in AID-assisted LAC countries, the following are suggested as guidelines for AID to take into account in making strategy and programming decisions that impact on Ag REE-strengthening.

- Create options for accelerated small farmer transition from basic food crops to the production of crops having high market demand.

AID-funded project assistance and non-project sector assistance (NPSA) should aim at improving knowledge of the institutional processes required to accelerate small farmer transition from the production of basic food crops to production of crops with higher market demand (e.g., NTAE crops).

- Provide incentives for Ag REE institutions to develop the capability to identify and be responsive to market demand.

AID support for Ag REE should aim at developing REE institutions responsive to market demand for basic food crops and livestock, import substitution crops, and traditional export and non-traditional agricultural export (NTAE) crops.

- Place top priority on project assistance and policy dialogue aimed at strengthening Ag REE institutions having a regional mandate.

Given the small size and limited resources of many AID-assisted LAC countries, AID should place the highest priority on investing in Ag REE organizations having both *regional* mandate and capability (or potential capability) to respond to Ag REE-strengthening needs at the national level.

- Use AID-assisted Ag REE organizations, in both the private and public sectors, to leverage needed change in public sector Ag REE institutions.

AID-created or supported private and public institutions should be used to the maximum extent feasible to leverage change in the public Ag REE system.

- Make Ag REE-strengthening an integral part of Agency policy dialogue with host-country governments, conditioning project assistance and non-project assistance (for the agricultural sector) on progress of the assisted country in moving toward sustainability.

AID project support to create or strengthen public or private REE institutions should be undertaken only where there is basis for projecting that assisted institutions will become *self-sustaining* in a desirable period. Here self-sustaining institutions include various organizational types between two extremes: private enterprises fully self-sustaining from privately-generated revenues as compared with public enterprises fully supported by publicly-provided resources. This process could be facilitated by AID making Ag REE-strengthening an integral part of Agency policy dialogue with host-country governments. Even in the absence of AID-funded projects, the Agency could use the concept of non-project sector assistance (NPSA) as a mechanism for stimulating the institutional changes needed in the public sector in order for Ag REE systems to function more productively. NPSA could be used to identify and stimulate needed changes in public Ag REE institutions, to ensure that needed institutional changes will be in place prior to launching projects that otherwise would

fail to achieve desired impact because of the absence of an adequate institutional base. A more detailed discussion of the application of NPSA to Ag REE-strengthening is presented in Byrnes (1991c).

- Coordinate design of project assistance and NPSA for Ag REE with development assistance provided by other donors.

The relative emphasis, if any, to be placed on research, extension, or education should be based on the particular constraints and opportunities present in each case. But AID assistance for strengthening Ag REE institutions should be coordinated with the Ag REE-strengthening programs of other donors. For example, in the case of Ecuador, Brown (1990) proposed that NPSA not focus on public sector extension as this was already being addressed through an Inter-American Development Bank initiative.

3. Ensure An Appropriate Balance of AID Funding for International (IARCs), Regional (RARCs), and National (NARS) Agricultural Research Centers or Systems

The Technical Advisory Committee (TAC) of the Consultative Group on International Agricultural Research (CGIAR) recently prepared at the CGIAR's request a background paper on "Relationships between CGIAR Centres and National Research Systems" (CGIAR, 1991). This paper raises several points with implications for the programming of AID funding for the international agricultural research centers (IARCs), the regional agricultural research centers (RARCs), and the national agricultural research systems (NARS).

The TAC reconfirmed that there is a need to strengthen national-level Ag REE systems, to ensure that these systems have adequate access to technology sources for adapting the productivity-increasing technologies farmers will need to help them respond to market opportunities.

While there are potential roles that the International Agricultural Research Centers (IARCs, e.g., ISNAR) can play in helping to strengthen national-level Ag REE systems, AID must play a leading role at the national level to help reverse the current downward spiral of deterioration in the TG&T capacity of the region's Ag REE systems. Relevant points for AID to bear in mind include:

- The TAC paper focuses on the key problem identified in the present Ag REE Inventory, i.e., the weakened TG&T capacity of national-level Ag REE systems in the LAC region.

- The weakened TG&T capability of NARS acts as a brake on the speed at which the NARS can access productivity-increasing technologies generated by the IARCs (or other sources) and adapt and transfer these technologies to farmers.

- The TAC raises the issue of whether the CGIAR should establish a policy on IARCs playing a strengthening role vis-à-vis national agricultural research systems (e.g., establishing a "research assistance unit" in each IARC). However, this solution only makes sense: (a) if IARCs have comparative advantage to take on such an expanded role; and (b) if the magnitude of the problem does not exceed the resources of the IARCs.

- Each LAC country already faces uncertainty over which is the best source of technical assistance (e.g. CIMMYT, CIAT, or CIP) in various areas (e.g., farming systems research); no individual center has a comparative advantage in terms of being the only source of technical assistance vis-à-vis Ag REE-strengthening.

- Continuing need for Ag REE-strengthening in many LAC (as well as African and Asian) countries suggests that the problem is of such magnitude that its solution goes beyond the resources of any one IARC, even those of ISNAR.

- Donors such as AID must work to ensure balanced investments at all levels: IARCs (including ISNAR), regional agricultural research centers (RARCs), and the public and private sector components of NARS.

- What the TAC does *not* address is the issue of whether the donors (e.g., AID) that comprise the CGIAR should establish a policy of working together to strengthen national agricultural research systems, not because the lack of strong national agricultural research systems is a constraint on the IARCs, but rather because a weak NARS is a constraint on broad-based economic growth.

- Weak TG&T systems in AID-assisted LAC countries can be strengthened only by creating a demand in these countries for strong Ag REE systems. However, the potential solution of broadening the mandate of the IARCs to include strengthening NARS is more supply-driven than demand-driven. Focusing primarily or only on strengthening NARS is too limited in scope, since there also are problems in most countries with agricultural education and extension.

- The LAC Bureau's objectives emphasize an improved macroeconomic and policy environment as the basis for a vigorous private sector response. Such response is a necessary, but not a sufficient, condition for achieving the goal of broad-based economic growth in the LAC region.

- However, as the macroeconomic and policy environment for investment in agriculture improves in the LAC region, there will be increased demand for productivity-increasing technologies, and therefore increased demand for adequate TG&T capacity to supply the technologies needed to respond vigorously to improving market opportunities.

- A key issue emerging from the Ag REE Inventory is the need for AID to exercise a leadership role with respect to making Ag REE-strengthening an integral part of

AID's policy dialogue with host-country governments, requiring that these governments agree to making a commitment to Ag REE-strengthening (e.g., increased autonomy and adequate budget support for TG&T) as a condition for receiving AID assistance.

- The possibility of such a policy dialogue approach, based on a demand-driven model of agricultural development, should be considered by AID in reaching a decision about the best means of strengthening the ability of NARS to interact with the IARCs.

- Policy dialogue can be advanced by non-project sector assistance (NPSA) programming to encourage host-government policy reforms and improved budget allocations to Ag REE systems, and/or by more traditional projects and programs providing technical support to regional TG&T.

4. Provide Appropriate Technical Support Through Existing or New Regional or Subregional Projects or Funding Mechanisms

A fourth option for LAC Ag REE-strengthening would be to provide greater funding for technical assistance delivered via regional or subregional projects, with funding for such projects supplemented where needed by Mission buy-ins. Brown (1990d) has identified the need for such a project for the Central American region (see Chapter III.B.3.f).

In the meantime, existing LAC Regional projects such as the Agriculture and Rural Development Technical Services (LAC TECH) project can provide some of the support (e.g., technical assistance) required. Existing or potential subregional projects (see section A.5 below) could also support Ag REE-strengthening in specific subregions. For example, the proposed Caribbean Basin Growers Association can play a role in strengthening TG&T for horticultural crops.

Yet none of the existing or planned projects or initiatives are focused on the fundamental problem of developing Ag REE systems to carry out demand-driven TG&T. Existing projects do not have a mandate to pursue the reform of policies and institutions that constrain emergence of Ag REE systems that are able to carry out demand-driven TG&T. Nor do we yet have validation of the concept of using NPSA as a tool for stimulating emergence of a demand-driven Ag REE system.

In any AID-assisted country, a decision to undertake NPSA as a vehicle for leveraging policy and institutional change in the country's Ag REE system would be the Mission's prerogative. But the whole process of designing and implementing NPSA to leverage institutional change in Ag REE systems, as well as coordinating NPSA with identification and design of required project assistance, could be facilitated by providing appropriate technical support under the LAC TECH project.

This technical support would assist the LAC USAID Missions in designing and implementing policy dialogue aimed at relaxing or removing policy and institutional con-

straints to emergence of a demand-driven Ag REE system. Constraints initially would be addressed through NPSA-funded policy dialogue, supported by any necessary studies and/or simultaneous or follow-up project assistance. The technical support would assist Missions by providing guidance with regard to: (1) designing and implementing NPSA targeted on the host-country's Ag REE system, and (2) identifying and designing appropriate project assistance for Ag REE-strengthening.

5. Organize Development Assistance Programming for Ag REE-strengthening in Terms of Subregional Programs

A fifth option for organizing assistance to strengthen Ag REE in the LAC region is to program assistance in terms of subregional programs. The following is suggestive of some of the possible subregional programs.

a. Andean Region

An assistance program for the Andean Region could provide funding under the Andean Trade Initiative to implement a program of non-project sector assistance (NPSA) in each of the AID-assisted Andean countries. An example of the NPSA concept, as applied to Ecuador, is presented in a separate paper (Byrnes, 1991c). Host-country and Mission participation in the NPSA program would be voluntary and aimed at removing or relaxing the institutional constraints to development of public sector Ag REE institutions. In each case, NPSA could be modeled on the NPSA guidelines proposed by Brown (1990c) and reviewed in Byrnes (1991c).

b. Caribbean Region

The Caribbean Region program could have at its core the proposed AID-assisted Caribbean Basin Growers Association (CBGA). This initiative will provide funding for a competitive grant research program on problems (e.g., pre- and postharvest pest and disease management) that are of common concern to growers of the nontraditional agricultural export (NTAE) crops. This avenue for programming assistance would provide for the participation of all AID-assisted Caribbean Basin Initiative (CBI) countries in both the Caribbean and Central America. The program also would recognize the role of RDO/C's Agricultural Research and Extension Project (AREP) in strengthening Ag REE in the Eastern Caribbean, although emphasis could be placed on ensuring AREP has adequate funds, perhaps by Mission buy-ins, to provide technical support for TG&T transfer in the region's two English-speaking countries (Jamaica and Belize). For NTAE crops, opportunities to collaborate with the West Indies Tropical Produce Support Project (TROPRO) should be explored and developed.

c. Central American Region

A Central American Region program could have at its core a ROCAP-funded Technical Support Project (TSP) to strengthen Ag REE capability of the Tropical Agricultural Research and Training Center (CATIE). The project would respond to the

current situation of virtual abandonment of bilateral support for agricultural research and higher education in Central America, with no new bilateral projects having been financed during the past five years or more. The general concept and specific details of this project's design would be developed in consultation with Central Americans knowledgeable about the region's Ag REE situation. The TSP could be structured to assist CATIE in developing the TG&T capability of key regional or national-level Ag REE institutions. In agricultural education, for example, key regional or national institutions would include EAP, ENA, EARTH, and ISA (in the Spanish-speaking Dominican Republic).

B. Overview of Assistance Options for Ag REE-Strengthening

This chapter has outlined a range of options for AID assistance for Ag REE-strengthening. Figure 7.1 on the following pages provides an overview of some of these options in relation to existing projects and Ag REE organizations in the LAC region.

Figure 7.1. Assistance Options for Ag REE-Strengthening in the LAC Region.

KEY: Acronyms are defined on the following pages
# = Completed or ongoing activity under LAC TECH (see following page for description of #)
E = Existing activity [RDO/C Agricultural Research and Extension Project (AREP)]
P = Proposed activity (project assistance or non-project sector assistance)
( ) = Perceived Feasibility of NPSA Program: H = High; M = Medium; L = Low
| = Eligible to participate in project (E or P) via coordination and/or buy-ins

	LAC Regional		Subregional		Country-Specific		AID-Assisted		Public
	LAC TECH	CBGA	RDO/C AREP	ROCAP TSP	* Project Assistance	NPSA	Private or Non-Gov't Orgs Research	Education	REE Agency
LAC Regional	#2	P			LAC TECH		IICA		
	#7				& DESFIL		CIMMYT,		
							CIAT, CIP		
Subregional:			E	P					
Andean						(H)			
Bolivia	#3				CRDP, PAO	(M)	PVOs, CIAT/IBTA		IBTA
Ecuador	#6				RTTS, AREEP	(H)	FUNDAGRO	various	INIAP
Perú	#13				ATT	(M)	FUNDEAGRO	UNA	INIAA
Caribbean	#1					(M)			
Dom. Rep.				?	AST, OFWM	(H)	JACC, ADF	ISA	DIA/SEA
Haiti			?		AP, TWM	(L)	PVOs		CDRA
Jamaica			?		JARP, AE	(M)	JADF	JSA	MOA (?)
RDO/C	#10				CARE, TROPRO	(M)	CARDI	UWI	(var.)
Central American				P	PROEXAG,	(M)			
Belize			?		CAC, TAM	(L)	BABCO		DOA/RD
Costa Rica					NTAE	(M)	CINDE/DIVAGRI	EARTH	DIA
El Salvador	#4				WM, AE	(M)	FUSADES/DIVAGRO	ENA	CENTA
Guatemala	#9				HADS, AD	(M)	GEXPRONT, ADF		ICTA
Honduras					LUPE, HARF	(M)	FPX, FHIA	EAP	PNIA
Nicaragua						?	APENN		MAG
Panamá						?	GREXPAN		IDIAP, MIDA
ROCAP	#5,#8,#11				RAHE, IPM	(H)	CATIE	CATIE	
Mexico	#12								

* = Only major current USAID projects with Ag REE components are listed here; a complete listing is provided in Chapter V, Section B.

Figure 7.1 (continued)

Summary of Completed or Ongoing Ag REE Activities under the LAC TECH Project (see Figure 7.1).

#1 = Congressionally-mandated "Feasibility Study on the Potential Benefits of Joint Agricultural Research and Education in the Caribbean Basin Region: A Report to the 101st Congress of the United States" (Byrnes, et al., 1990). (Study team led by LAC TECH REE advisor)

#2 = LAC/DR/RD-requested "Inventory of Agricultural Research, Extension, and Education in the LAC Region" (in process). (Study being conducted by LAC TECH Ag REE advisor)

#3 = USAID/Bolivia-requested "Training Needs Assessment for Agricultural Research and Extension in the Chapare and Associated High Valley Regions of the Department of Cochabamba, Bolivia" (Byrnes, 1990b); and "Recommendations for Designing Selected Institutional Components of the Alternative Development Project" (Byrnes, 1991a) (LAC TECH Ag REE advisor)

#4 = USAID/El Salvador-requested "Terms of Reference for the Process to Privatize El Salvador's National Agricultural School (ENA)" (Byrnes, 1990c). (LAC TECH Ag REE advisor)

#5 = USAID/ROCAP-requested "Central American Agricultural Research and Professional Education: A Concept Paper for ROCAP" (Brown, 1990d). (LAC TECH Ag Policy advisor)

#6 = USAID/Ecuador-requested "Ecuador NPSA Concept Paper: Research, Education, and Extension" (Brown, 1990c). (LAC TECH Ag Policy advisor)

#7 = LAC/DR/RD-requested assistance in organizing Caribbean Basin Growers Association (CBGA) (LAC TECH Ag REE advisor and Agribusiness and Trade advisor)

#8 = USAID/ROCAP-requested assistance to develop a proposal for CATIE to become an international forestry and agro-forestry research center (LAC TECH Ag Policy advisor)

#9 = USAID/Guatemala-requested "'From Coffeepot to Cafeteria:' Toward an Alternative Model for ANACAFE's Extension Program for Small Farmer Coffee Producers" (Byrnes, 1991b) (LAC TECH Ag REE advisor)

#10 = USAID/ RDO/C-requested "An Assessment of Human Resource Development Training Needs in the Eastern Caribbean Agricultural Sector." (LAC TECH Ag REE advisor)

#11 = USAID/ROCAP-requested assistance in developing a concept paper for a proposed Sustainable Environmental Protection and Agricultural Trade (SEPAT) project. (LAC TECH Ag REE advisor)

#12 = USAID/Mexico-requested assistance to present keynote address on "Problemas en la Sostenibiidad de Sistemas Tecnológicos Agrícolas en América Latina y Opciones para el Futuro" at the Symposium on "Agricultura Sostenible: Una Opción para el Desarrollo sin Deterioro Ambiental," Colegio de Postgraduados, Chapingo, Mexico. (LAC TECH Ag REE advisor)

#13 = USAID/Perú-requested concept paper "Toward Privatization of INIAA: Some Key Issues and Questions." (LAC TECH Ag REE advisor)

Figure 7.1 (continued)

Acronym	Name of Organization or Project
AD	Agribusiness Development Project (El Salvador and Guatemala)
ADF	Agricultural Development Foundation (Dominican Republic)
AE	Agricultural Education Project (Ecuador and Jamaica)
ANACAFE	National Coffee Association (Guatemala)
AP	Agroforestry Program Project (Haiti)
APENN	Nicaraguan Non-Traditional Agricultural Growers and Exporters Association
AREE	Agricultural Research, Extension, and Education Project (Ecuador)
AST	Agricultural Sector Training Project (Dominican Republic)
ATT	Agricultural Technology Transfer Project (Perú)
BABCO	Belize Agribusiness Company
CAC	Commercialization of Alternative Crops Project (Belize)
CARDI	Caribbean Agricultural Research and Development Institute (Trinidad)
CARE	Caribbean Agricultural Research and Extension Project (RDO/C)
CATIE	Tropical Agricultural Research and Training Center (Costa Rica)
CBGA	Caribbean Basin Growers Association Project (proposed)
CDRA	Agricultural Research and Documentation Center (Haiti)
CENTA	Agricultural Technology Center (El Salvador)
CIAT	International Center for Tropical Agriculture (Colombia)
CIAT/IBTA	Tropical Agricultural Research Center of IBTA (Santa Cruz, Bolivia)
CIMMYT	International Maize and Wheat Improvement Center (Mexico)
CINDE	Costa Rican Coalition of Development Initiatives
CINDE/DIVAGRI	Agricultural Division of CINDE (Costa Rica)
CIP	International Potato Center (Perú)
CRDP	Chapare Regional Development Project (Bolivia)
DESFIL	Development Strategies for Fragile Lands Project (S&T/RD)
DIA	General Directorate of Agricultural Research, MAG (Costa Rica)
DIA/SEA	Department of Agricultural Research of SEA (Dominican Republic)
DOA/RD	Department of Agricultural Research-Research Division (MOA of Belize)
EAP	Pan American Agricultural School (Zamorano) (Honduras)
EARTH	Agricultural School for the Rural Humid Tropics (Costa Rica)
ENA	National School of Agriculture (El Salvador)
FEPADE	Entrepreneurial Foundation for Educational Development (El Salvador)
FHIA	Honduran Agricultural Research Foundation
FPX	Federation of Agricultural and Agroindustrial Producers and Exporters of Honduras
FUNDAGRO	Foundation for Agricultural Development (Ecuador)
FUNDEAGO	Foundation of Agricultural Development (Perú)
FUSADES	Salvadoran Foundation for Economic and Social Development
FUSADES/DIVAGRO	Agricultural Division of FUSADES (El Salvador)
GEXPRONT	Non-Traditional Products Exporters Association (Guatemala)
GREXPAN	Non-Traditional Agricultural Producers and Exporters Association
HADS	Highlands Agricultural Development Project (Guatemala)
HARF	Honduran Agricultural Research Foundation Project
IBTA	Bolivian Institute of Agricultural Technology
ICTA	Agricultural Science and Technology Institute (Guatemala)
IDB	Inter-American Development Bank
IDIAP	Panamanian Institute of Agricultural Research

Figure 7.1 (continued)

Acronym	Name of Organization or Project
IICA	Inter-American Institute for Cooperation on Agriculture (Costa Rica)
INIAA	National Institute for Agricultural and Agro-Industrial Research (Perú)
INIAP	National Institute of Agricultural Research (Ecuador)
IPM	Integrated Pest Management Project (ROCAP)
ISA	Superior Institute of Agriculture (Dominican Republic)
JACC	Joint Agricultural Coinvestment Council (Dominican Republic)
JADF	Jamaican Agricultural Development Foundation
JARP	Jamaica Agricultural Research Project
JSA	Jamaica School of Agriculture
LAC TECH	Agriculture and Rural Development Technical Support (ARDTS) Project
LD	Livestock Development Project (Belize)
LUPE	Land Use Productivity Enhancement (Honduras)
MAG	Ministry of Agriculture and Livestock (Nicaragua)
MIDA	Ministry of Agricultural Development (Panamá)
MOA	Ministry of Agriculture (generic)
NTAE	Non-Traditional Agricultural Export (NTAE) Technical Support Project (Costa Rica)
NPSA	Non-Project Sector Assistance (generic)
OFWM	On-Farm Water Management Project (Dominican Republic)
PAO	Private Agricultural Producer Organizations Project (Bolivia)
PNIA	National Program of Agricultural Research (Ministry of Natural Resources, Honduras)
PROEXAG	Non-Traditional Agricultural Export Support Project (Guatemala)
PVO	Private Voluntary Organization (generic)
RAHE	Regional Agricultural Higher Education (ROCAP)
RDO/C	Regional Development Office for the Caribbean
ROCAP	Regional Office for Central America and Panamá
RTTS	Rural Technology Transfer Systems Project (Ecuador)
SEA	Secretary of State for Agriculture (MOA of Dominican Republic)
SERA	Agricultural Research Division of the MOA (Haiti)
SRN	Ministry of Natural Resources (Honduras)
TROPRO	West Indies Tropical Produce Support Project (RDO/C)
TSP	Technical Support Project (generic)
TWM	Target Watershed Management Project (Haiti)
UNA	National Agrarian University (Perú)
UWI	University of the West Indies (Trinidad)
WM	Water Management Project (El Salvador)

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Annex A. A Review of the Agricultural Research, Extension, and Education Components of LAC Mission Country Development Strategy Statements (CDSSs).

Annex B. A Review of the Agricultural Research, Extension, and Education Components of USAID Mission Agriculture and Rural Development Portfolios in the LAC Region

Annex C. LAC/DR/PD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs.

Annex D. Case Studies of USAID Mission Responses to LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs.

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Caribbean Region	USAID/Dominican Republic USAID/Haiti USAID/Jamaica USAID RDO/C
Central American Region	USAID/Belize USAID/Costa Rica USAID/El Salvador USAID/Guatemala USAID/Honduras USAID ROCAP

Annex E. Survey Questionnaire Summary Tables of USAID Mission Assessments of Status of Agricultural REE in AID-Assisted LAC Countries.

Annex F. Summary Description of Key Agricultural REE Organizations in AID-Assisted LAC Countries.

Annex G. TAC Paper on Relationships between CGIAR Centres and National Research Systems: Key Points & Questions.

LAC TECH

AGRICULTURE AND RURAL DEVELOPMENT TECHNICAL SERVICES PROJECT
AID/LAC/DR/RD, CHEMONICS INTERNATIONAL, U.S. DEPT. OF AGRICULTURE

A CROSS-CUTTING ANALYSIS OF AGRICULTURAL RESEARCH, EXTENSION, AND EDUCATION (AG REE) IN AID-ASSISTED LAC COUNTRIES

VOLUME TWO: ANNEXES

by

Kerry J. Byrnes

Submitted to:

U.S. Agency for International Development
Bureau for Latin America and the Caribbean
Office of Development Resources
Rural Development Division
LAC/DR/RD

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[1]The ideas expressed herein do not necessarily represent the views or policies of the U.S. Agency for International Development (USAID) or Chemonics International. Any errors are the sole responsibility of the author.

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ANNEX A
A REVIEW THE AGRICULTURAL RESEARCH, EXTENSION, AND EDUCATION COMPONENTS OF LAC MISSION COUNTRY DEVELOPMENT STRATEGY STATEMENTS (CDSSS)

This annex reviews Country Development Strategy Statements (CDSSs) from the late 1970s to the present, for each of 13 USAID Missions in the Latin America and the Caribbean (LAC) region, except Nicaragua and Panamá.[1] For each Mission, the review compiles material, drawn from the CDSSs prepared by that Mission, that describes the Mission's development assistance strategy vis-à-vis agricultural research, extension, and/or education. A review of this material for each Mission provides an indication of changes over time in the degree to which agricultural research, extension, and/or education were identified by a Mission as problematic and how the Mission proposed to respond to identified problems in this area. The CDSS material is presented in the following order of regions and countries:

Andean Region

- Bolivia
- Ecuador
- Perú

Caribbean Region

- Dominican Republic
- Haiti
- Jamaica
- RDO/C

Central American Region

- Belize
- Costa Rica
- El Salvador
- Guatemala
- Honduras
- ROCAP

[1]USAID did not provide support for development assistance in Nicaragua during much of the 1980s and provided development assistance to Panamá only through part of 1987. As of early 1990, AID was in the process of reestablishing development assistance programs in both Nicaragua and Panamá. Because of the discontinuity in AID's assistance program for these two countries during the 1980s, the present annex does not summarize material relating to the agricultural research, extension, and education components of the CDSSs for these two countries. However, the CDSSs for these two countries are on file in the LAC TECH library and the relevant material in these CDSSs may be added to this annex at a later date.

BOLIVIA

FY 81 (1/79)

This CDSS noted that Bolivia's "rapid economic growth during the period 1972-1977 [had] only marginal impact on improving the socio-economic condition" of the country's poor." Further, the CDSS indicated that Bolivia's farmers have not adopted modern production techniques; consequently, they have "the lowest agriculture productivity rates in South America." This owed, in part, to the Government of Bolivia's (GOB)

> extremely low research capability, and inappropriate technologies. The GOB's poorly organized and inadequately supported agricultural efforts have resulted in the organization of agricultural services as a complex and frequently overlapping set of non-linked programs. Extension programs in particular suffer from lack of budgetary and policy support, as well as trained personnel.

On this latter point, Bolivia's university system did not provide training in areas such as farm management and social sciences; as a result, the country lacked a cadre of qualified professional agricultural personnel to serve in technical, managerial, and planning positions.

USAID/Bolivia's sector goal for agriculture and rural development was "to increase the per capita income and standard of living of the rural poor." The Mission's objectives included: appropriate technologies (production, processing, marketing) identified in food and vegetable crops and animal husbandry for small farm use; public sector extension service strengthened through use of nation-wide radio and part-time local agricultural promoters; personnel trained in various agricultural fields at various levels [40 M.S., 743 academic short-term (93 international and 650 in-country), and 448 in-service].

The strategy was "to broaden productive employment" through improving "small farmer access" to various inputs including "appropriate technology." Mission projects were to be implemented via ministries, Departmental Development Corporations (DDCs), and/ or PVOs. The Mission recognized that "a comprehensive assistance package including technical experts, equipment, supplies, working capital and training opportunities" would be "a major new activity" in the area of "public services relating to technological and extension development." Indeed, the appropriate technology area was identified as one of the Mission's "major new thrusts during the planning period."

This thrust was to entail assistance "to strengthen the capability of private and public entities to identify, design, test and promote low cost technologies which can increase agricultural production and productivity...." As a first phase, the Mission planned to support applied research and development

> by providing technical assistance, training, equipment, materials, research grants, and pilot funding for feasibility studies, testing/demonstration activities, evaluation and promotion of appropriate technologies. A second phase effort will provide assistance

to promote, purchase and install proven technologies in order to assure their rapid dissemination and utilization.

In regard to this latter point, the Mission planned "a major thrust in agricultural extension through the training and part-time employment of farmer/extension agents. Also, a program to improve the university system will be proposed, possibly in collaboration with a Title XII initiative."

FY 82 (1/80)

The goal for the 1982-86 planning period was "to promote growth with equity in order to achieve an improved standard of living for Bolivia's poor." A first objective was to increase agricultural production through better small farmer access to inputs, including improved technology and management of natural resources and "increased development of the private sector." The Mission's strategy was based on

> the premise that to achieve growth with equity..., Bolivia must have a social framework which allows and encourages the participation of the poor.... Given the centralized nature of the Bolivian government, the Mission believes that to encourage increased target group participation, development efforts should be aimed at...regional and local levels. The strategy, therefore, will be to design projects which require local responsibility, develop local capacity, encourage upward articulation of local solutions for development problems....

The strategy entailed: (1) decentralized operation through the Departmental Development Corporations, regional offices of central ministries, municipalities. and private sector organizations; and (2) use of private sector organizations, including PVOs where effective and appropriate. The CDSS noted that this

> decentralization is aimed at achieving a greater degree of local input and decreasing the dependence on national level support. The Mission will search for local and private sector alternatives to national public sector activities, based on the conclusion that Bolivian government organizations cannot effectively implement the full array of activities needed to achieve the Mission's goals. This decentralization implies a somewhat reduced emphasis on institution building at the national level.

In the agriculture and rural development sector, the CDSS noted that local paraprofessionals would be used in the Agricultural Extension and Technology Development and Diffusion projects. These two projects were to improve small farmer access to production inputs. The CDSS stated that agricultural

> technology extension [would] be emphasized over research. The proposed extension system will be used to transmit appropriate mechanical and conservation technologies as well as tested agronomic practices; technology development and adaptation activities will be included.

The Agricultural Extension project would include a component for adaptation and extension of intermediate agricultural technologies such as tools, small threshers, and animal traction.

A narcotics strategy was introduced in the FY 82 CDSS. This strategy was to be implemented through the Chapare Regional Development Project.

FY 83 (1/81)

The Mission's strategy for this planning period provided for a reduction of counterpart and an increase in private sector involvement:

> Given the critical financial and administrative situation of the GOB, projects will be designed to minimize government commitment of funds, particularly new recurrent expenditures.... In all sectors, we will seek to expand the use of private entities to reach the target group. Experience with the private sector convinces us that more can be done outside and around the institutional constraints which plague the GOB.

Rather than seek to strengthen GOB ministries, the strategy aimed at generating off-farm employment in "market towns."

Sector objectives in agriculture and rural development were to be pursued "by increasing local participation in decision-making through decentralization and strengthening of rural organizations...." Four priority areas for small farmer development were to be emphasized: (a) improvement in the delivery of agricultural inputs, technical assistance, and credit; (b) expanded market accessibility and efficiency; (c) greater access to technology adapted to local requirements; and (d) better management of natural resources. In (c), the emphasis would be on "local adaptation and diffusion of technology" through the establishment of "interactive processes of local adaptation and dissemination of farm technologies, stressing local participation. The CDSS stated that the Mission was "fully prepared to initiate a development project in the Chapare to provide alternatives to coca production, assuming the GOB implements an effective narcotics program to control the illegal processing and trafficking of coca and its derivatives."

FY 89-93 (4/88)

The Mission's goal for the 1989-93 period is "Basic Structural Reforms Leading to Rapid and Sustained Economic Growth." The secondary goal is "Shared Benefits of Growth." Central to the first goal is increasing non-traditional exports. Major obstacles to increased exports were identified as lack of market information, credit, and infrastructure, as well as inappropriate GOB policies. The Mission's strategy for the agriculture sector includes policy dialogue and concentrating on marketing, infrastructure, and productivity, in order to lower food costs, raise producer incomes, and increase selected exports. The Mission's "Alternative Development program" would support narcotics control primarily through social and economic assistance to farmers transitioning from coca production to other crops. The CDSS also indicated that the Mission would "intensify its narcotics awareness efforts."

The Mission agreed with "the GOB's emphasis on export-led growth and [proposed] to orient...its resources towards a non-traditional export bias." In this respect, the CDSS stated:

> Strengthening the private sector will continue to be at the heart of the Mission's strategy. In addition to improving the financial, policy and institutional conditions that currently constrain the private sector, the program will strengthen the entrepreneurial spirit of businessmen, large and small, and develop and enhance their institutional capacity to participate in the formulation of new, market-oriented economic policies.

Based on the USAID-funded Agriculture Sector Assessment in 1987, the CDSS noted that the Mission would focus on marketing, infrastructure (mostly market feeder roads and storage facilities), and productivity. Assistance for product development, productivity improvement, and quality control would be provided under the Export Promotion project.

The CDSS noted that the Mission, based on the Agricultural Sector Assessment, had

> opted for a marketing-led, rather than a productivity-led agricultural development strategy since this is the major factor determining the cost of food to consumers, as well as the major constraint to improving incomes of producers and increasing agricultural exports.... Bolivia's principal agricultural exports, e.g., lumber, wood products, cattle and cattle products, and soybeans, are from the lowlands. Moreover, the lowlands have the greatest potential for increased agricultural exports for the foreseeable future.

The CDSS notes that Bolivia would continue to rely on the Altiplano and valley areas for the production of much of the country's food needs, and that the Mission would primarily focus on "increasing the efficiency of the domestic marketing system through the improvement of market information channels, improved collection, storage, and processing facilities, and improved farm to market transportation." The CDSS acknowledged that:

> Increased productivity through higher yielding technologies and more sophisticated agricultural inputs [would] be a secondary element of the Mission's strategy.

But there was recognition that "productivity gains and marketing efficiencies are...necessary to generate the surpluses and the financing required to shift out of strictly domestic foodstuff production and into a combination of production for internal consumption and export." Potential highland and valley agricultural products with export potential were identified. Finally, the CDSS indicated that the Mission's strategy would "include education and training to provide the trained human resource base upon which sustained development depends."

ECUADOR

FY 82 (1/80)

The process of renewing USAID development assistance to Ecuador started in mid 1978, following a United States Government decision to support Ecuador's return to a democratic, constitutional government. In January 1980, after a seven-year phase-out process, USAID/Ecuador's program was being renewed to support the socio-economic objectives of the new democratic Government of Ecuador (GOE), which assumed power August 10, 1979. The GOE identified four development priorities: the multiple problems of the rural and urban poor; severe deforestation and environmental problems; the energy shortages the country might face by the mid-1980s as oil consumption threatens to exceed production; and the major constraints in the GOE's public administration system which impede the development and implementation of its socio-economic policies and programs.

The CDSS noted that the focus of the Mission's development assistance strategy would be on "integrated rural and urban development programs that benefit the poorer segments of the Ecuadorean population, initially in carefully selected geographic areas and; once these programs are tested, on a national basis with GOE and other donor funding." This strategy was based on the GOE's 1980-84 Development Plan, the growth with equity objectives of which closely paralleled USAID's policy of assisting programs that meet the basic human needs of low- income families.

The emphasis on integrated rural development (IRD) is based on recognition that

> most of the rural poor are not so much "small farmers" as they are multiple jobholders whose opportunities lie not just in agriculture but also in other economic activities. A focus on these other activities, and on their interrelationships with agriculture, is essential for achieving the GOE's objective of providing a more equitable geographic distribution of the benefits of economic growth.

The Mission's strategy was to support the GOE's objectives via

> a package of activities designed to develop, test, and establish low-cost delivery systems.... The ultimate goal of USAID support is to leave behind, upon termination of AID assistance, an institutionalized capability--both in the GOE and at the community level--to deal with rural poverty problems on a sustained and effective basis.

The CDSS noted that agricultural research in Ecuador does not have

> a small-farmer or poverty orientation, and there is little diffusion of research results. The extension service is weak and its activities are not well coordinated with other GOE services and policies. ...little attention has been given to developing more appropriate technologies for dealing with problems of agrarian reform, small-farmer marketing systems, more effective participation of women in production and

marketing processes, and alternative employment opportunities.... GOE services in research, education,...marketing, and credit are limited in scope or directed mainly to medium and large-size farmers.

The Mission's proposed response was: (1) institutional development activities designed to develop and/or strengthen the links between national, regional, and local organizations and the rural poor; and (2) area-specific action programs of a demonstration nature designed to test innovative approaches to raising agricultural production and increasing agricultural and non-agricultural incomes and employment. The Mission proposed, beginning in 1980, to support a Title XII Technological Transfer System project, with the following objectives:

1. To strengthen rural-sector institutions and their capacity to reach the rural poor through (a) effective links among research, extension, and education institutions; and (b) training and assistance to the proposed Rural Training Institute; and

2. To develop technologies appropriate to the needs of small farmers and the rural poor.

The IRD component of the Mission's strategy was to begin in FY 80 with an Integrated Rural Development project that would support a range of services, including development and dissemination of technological packages appropriate for small farmers, and expanded extension services utilizing local paraprofessionals. The CDSS noted that: "Agricultural production and employment activities are being emphasized first because these are the most important for ensuring self-sustaining area development."

FY 83 (1/81)

As of January 1981, the FY 82-86 strategy approved in January 1980 remained fundamentally unchanged. The strategy's focus on integrated rural development (IRD), the CDSS noted,

> builds on the experience of previous AID and GOE development efforts showing that single-faceted projects—unrelated and dispersed throughout the country—have had only a limited impact on improving the conditions of low income families. Integrated approaches that concentrate limited resources and services in specific geographic areas are believed to be more effective in addressing the country's critical poverty problems.

Further, the CDSS noted that the GOE's IRD approach recognizes that

> the multiple problems of the rural poor...cannot be attacked by any one GOE ministry or agency. The GOE believes that they must be attacked on an area specific, integrated basis by a number of different GOE entities (e.g., Ministries of Agriculture, Health, Education), each working together in a coordinated manner.

However, an Integrated Rural Development Secretariat (SEDRI) was created and a fund established in October, 1980, to finance IRD projects and facilitate the coordination and implementation of IRD projects.

USAID support to the GOE IRD strategy was scheduled to be provided in three stages. Stage 1 includes three projects: Integrated Rural Development (IRD), Rural Technology Transfer (Title XII), and Rural Training Systems. The IRD project was to assist the GOE to make operational its IRD mechanism in three area-specific IRD projects and implement model small farmer delivery and production systems that could be replicated nationwide. The Rural Technology Transfer project was to assist the GOE in mobilizing technical expertise from U.S. land-grant universities to assist in improving Ecuadorean agricultural research, education, and extension institutions working on small farmer problems in the target IRD project areas.[2]

The Rural Training Systems project was to train campesinos to better identify and implement local development activities. To the extent feasible, emphasis was to be placed on agricultural commodities considered strategic by the GOE because of their importance in the food basket of the poor or their export potential.[3]

Further, the GOE had recently established a new Science and Technology Council (CONACYT) to begin upgrading Ecuador's scientific and technological resources and direct them to the problems of the poor. The Mission proposed, under one or more of its projects, to develop links between CONACYT and U.S. and Latin American sources of technology, particularly in those areas that address the country's key poverty problems, and to provide support for demonstration and dissemination activities implemented through Ecuador's universities and research facilities.

The CDSS also noted the Mission's support for projects that were being implemented by Private Voluntary Organizations (PVOs). None of the identified PVOs and/or their projects, however, were focusing specifically on the problem of developing agricultural research, extension, and/or education. A PVO, Fundación NATURA, was undertaking a program to educate the Ecuadorean public on the country's environmental problems, and was preparing an environmental profile that would provide the basis for designing projects to deal with forestry, soil conservation, and natural resources. The CDSS concluded with the observation that:

> Serious institutional, technological and human resource constraints limit Ecuador's ability to absorb resources and channel them to its most critical problem areas. The modest AID program addresses these constraints. It contributes to filling the gap between the GOE's strong growth-with-equity commitment and the weak institutional,

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[2]This project followed on a 1979 Title XII Study on Agricultural Research, Education and Extension in Ecuador.

[3]Stage 2 was to include a Rural Health, Nutrition, and Potable Water project, while Stage 3 was to include three projects: Forestry and Soil Conservation, Small Rural Enterprises and Agroindustry, and Rural Education.

technological, and human resource capacity for dealing with the country's highest priority development problems.

FY 85 (5/83)

This CDSS includes an analysis of the reasons for "weak technology development" in Ecuador; generally, the CDSS pointed out, the country's institutional base for research, extension, and education is weak. To make technology a more effective tool for Ecuador's development, the Mission was assisting CONACYT to create a Rural Technology Transfer System to encourage links between Ecuadorean entities involved in applied research and Title XII universities. Also, the Mission, through the Campesino Training Institute (INCAA), sought to strengthen extension programs by introducing the use of innovative non-formal education techniques.

While Ecuador was facing a deteriorated economic situation at the time of this CDSS, the CDSS noted that

> USAID will continue its approach of using projects having a mix of technical assistance, training, and research activities as means to upgrade Ecuadorian private and public institutional capacity to develop and implement appropriate policies as well as to develop, adapt, and utilize appropriate technologies.... By the end of the CDSS period, USAID expects that projects...which it finances will have contributed significantly towards bringing about a more efficient public sector and a more dynamic private sector.

The CDSS included a private sector strategy outlining a series of projects that would promote and generate increased productivity, particularly in forestry and fisheries.

Further, the CDSS noted a number of factors, including the lack of improved technologies to increase productivity and to reduce costs of production, as explaining the depressed state of the country's agricultural sector. The CDSS also pointed to the importance of Ecuadorian institutions that were weak and unable to coordinate

> their policies and programs and to find innovative, effective solutions and technologies to cope with...sector problems. These institutions are hindered by a lack of qualified personnel and funds, inappropriate information on which to base decisions, inappropriate organizational structures, and inappropriate delivery systems.

The Mission's response was four projects: Rural Technology Transfer Systems (RTTS), Integrated Rural Development (IRD), Campesino Training Institute, and Forestry Development. Coordinated actions in farming systems research, farm extension specifically oriented to the *campesino's* cultural background, and other support activities were being brought together for the first time under the IRD and Campesino Training projects. "Eventually, the experience of these projects will be replicated by the GOE throughout the seventeen programmed IRD areas...."

But the economic crisis in Ecuador at the time of this CDSS' preparation led the Mission to highlight

> the need to increase the emphasis on productive activities in the agricultural sector, especially those leading to improved productivity, increased food production, the creation of jobs, and the generation of an exportable surplus. Accordingly, while continuing to expand the market participation of small farmers in the present geographic target areas, USAID proposes to increase its attention to reach the small to medium size farmers already in the commercial sector and with an adequate resource base. These farmers have the potential to increase significantly their production in the short run, both for the domestic and the export market, as well as to absorb additional labor.

Accordingly, the Mission proposed to increase its support to "key Ecuadorian institutions, both public and private, which play a role in promoting agricultural production/productivity and in related marketing systems." Specifically, the Mission proposed

> to develop a series of projects to stimulate small and medium commercial farm development which would result in increased staple food production and diversification into high value and non-traditional crops.

One proposed project, Private Sector Agricultural Technology Transfer, would promote private sector research on and transfer (delivery) of agricultural technologies to farmers through producers' associations and farmer cooperatives or through agro-industrial and agro-business enterprises. Another proposed project, On-farm Water and Soil Management, would assist GOE institutions in developing programs to rationalize on-farm water usage and promote soil conservation.

FY 86 (1/84)

This CDSS's Executive Summary noted a "changing emphasis to evolve in the USAID portfolio before the end of the CDSS period," as follows (only those relating most directly to agricultural research, extension, and/or education are listed):

1. Development of a private sector outreach capacity with new programs in non-traditional export promotion and private sector human resource development.

2. New emphasis on the role of agri-businesses as private sector service structures for agriculture and increased attention on collaborative research programs with the private sector.

3. Completion and satisfactory accomplishment of existing programs focusing largely on Sierra agriculture and public sector service delivery to subsistence farmers.

4. Greater emphasis on small-scale commercial farmers.

5. New efforts to overcome agricultural institutional deficiencies through improving the agriculture education system.

This CDSS noted that, in agriculture, "the shortage of well trained staff for both public and private sector entities is due to the inadequacies of the present agricultural educational institutions. There are insufficient numbers of agricultural professors with advanced training. This, in turn, reflects the absence of graduate programs in agricultural science." Accordingly, the Mission planned to be involved in "strengthening the agricultural education system."

Given the high cost of agricultural research, it is of interest to note the emphasis which this CDSS places on "Doing More With Less." USAID/Ecuador's

> relatively small program must continue to emphasize low cost approaches that demonstrate affordable models. USAID is successfully using pilot or area specific approaches funded by grants or grant/loan packages to test and develop model activities in key sectors. These activities often have important institution building components involving technical assistance, training, and learning-by-doing. Effective implementation depends on the success of these institution building efforts which require substantial monitoring and management by USAID staff, particularly during the early stages of projects. Through modest initial investments, USAID promotes cost-effective models that can be replicated on a national scale using domestic or other donor resources, and creates institutions capable of absorbing and effectively utilizing these resources.

The CDSS also indicated the increased role that PVOs would play.

Given that "agriculture has the potential to be one of the main engines of growth over the next decade," the CDSS identified an "improved technology generation and transfer system" as one of the requirements to achieve this potential. New activities would focus on the coastal area, while the focus in the Sierra would be on completing the ongoing IRD project. In terms of institution building and technology transfer objectives, the CDSS noted that the RTTS project was establishing in CONACYT an improved capacity for setting research priorities and coordinating research and disseminating results. Further, through the IRD and the Campesino Training projects, the GOE was developing strengthened capacity to promote development of interinstitutional links and coordination of field level support programs. Finally, the Mission proposed a "program of support to strengthen university agricultural education" to be carried out during the last half of the CDSS period.

In terms of private sector participation objectives, the CDSS noted that public sector cooperation with private agribusiness was being promoted through the RTTS projects (e.g., financing research and demonstrations carried out by private groups). Further, the Mission's private sector program included an agricultural component in terms of its support for development of non-traditional agricultural exports. In terms of technology transfer objectives, the CDSS noted the constraints as follows: "inadequate provision of services for assisting or

training exporters in the commercialization of non-traditional exports; and limited supply of "export-quality" technology advice at the production stage."

Overall, this CDSS reflected a growing concern by the Mission, in each program area, to address, when relevant, a mix of policy, institution building, technology transfer, and private sector participation objectives.

FY 90 (1/89)

This CDSS noted that the basic constraints to more rapid and equitable growth of agriculture still remained, including, among other factors, low productivity and high costs due to dependence on traditional technologies, and ineffective institutions and inadequate investment in human capital:

> The agricultural science base, comprised of the set of scientists, technicians, and associated institutions involved in accessing, adapting, generating and diffusing new and improved technical practices for agriculture, is especially deficient, because of: a) relatively low and ad hoc investments in research and technology transfer; b) loss of most of the few senior agricultural scientists previously in the system; c) inadequate salaries and recognition to attract and hold top-notch people; d) inadequate link up with international research and technology transfer centers; and e) woefully inadequate investments in agricultural education. These deficiencies, in turn, have contributed to: a) a naive reliance on imported "shelf" technologies; b) lack of focus and priorities; c) discontinuity of effort and short-term focus; d) inadequate, uncoordinated, and largely ineffective technology transfer efforts; and e) almost no linkages, coordination, or communication among research, education, and extension institutions serving agriculture.

The CDSS notes the Mission's "major concern" about a number of areas, including low resource levels and efficiency in the agricultural research and extension system, degradation of natural resources and the environment, and major inadequacies and inefficiencies in the agricultural education system. Also, appearing for the first time as a problem area in a USAID/Ecuador CDSS is the area of the problems resulting from an information gap on narcotics awareness.

The Mission's strategy for agriculture continues to be that set forth in the prior CDSS. A major component of the strategy is "strengthening the science base for agriculture through technology adaptation and transfer." The strengthening of the science base is to continue through ongoing support to private sector producer associations and by fostering stronger links between farmers and various public and private agencies, including the National Agricultural Research Institute (INIAP) and the Foundation for Agricultural Development (FUNDAGRO).

PERÚ

FY 81 (1/79)

This CDSS stated that USAID/Perú's strategy is to "stimulate and sustain progress toward the elimination of absolute poverty until the Peruvian economy is able to assume this task fully and independently." The strategy had three components: (1) sierra social programs; (2) sierra and high jungle economic growth; and (3) coastal urban basic human needs. The strategy in the second of these components was to create an agricultural growth dynamic in the Sierra and the adjacent High Jungle (selva). Mission resources were to be concentrated in those sierra/selva sub-regions which demonstrate the greatest productive capacity, and migration would be encouraged from the least-productive poverty regions of the sierra to areas with greater economic potential in the sierra and high jungle. The Mission's strategy was expected to have varying impacts on the target groups: (1) independent, market-oriented farmers (sierra and high jungle); (2) agrarian reform beneficiaries; (3) campesino communities and groups; (4) landless and near landless; and (5) urban poor.

During the preceding ten years, considerable deterioration had taken place in the agricultural research, extension, and education system. Deterioration took place in the capability of technical personnel, in the quality of program design and execution, and in physical facilities/equipment. The CDSS reported that the Government of Perú (GOP) had taken policy steps since 1977 to reverse this trend but lacked the resources to revitalize the system. A Title XII comprehensive baseline study of the research, extension, and education system was to be undertaken in 1979; this study would serve as a guide to Mission programming. The CDSS noted that the Mission was "convinced that Peruvian agriculture will continue to stagnate without an aggressive long-term commitment in this area."

FY 82 (1/80)

This USAID/Perú CDSS was the first to make mention of the role of narcotics in the Mission's program. The high jungle of Huanuco is a major coca growing area

> and the source of the raw material for much of the illicit narcotics trade. A major U.S. objective is to reduce significantly the illicit excess coca crop, bearing in mind that AID development projects in such areas can be important in reducing production of narcotics and in promoting alternative development.

During 1979, a Title XII comprehensive baseline study of the research, extension, and education system was completed; the CDSS noted that this study formed

> the basis for a major program of assistance in five of Perú's most important food crops. This loan/grant project will begin in FY 80. By FY 82 or 83 we will be ready for the recommended second phase dealing with livestock, especially aimed at sheep, llama and alpaca—the principal income source for the sierra farmer.

FY 83 (1/81)

Under the Mission's Sierra and High Jungle Economic Growth program, the Agricultural Research, Extension, and Education project (AID loan/grant signed in August of 1980) was to assist the GOP in creating a new "Ag. REE system." USAID funds were to finance training, equipment, salary support, and technical assistance in establishing national production programs, research centers, and extension services.

FY 86 (1/84)

This CDSS proposed that USAID/Perú would "strengthen and expand private sector institutions and development approaches" and put "greater emphasis on agriculture and exports." The former would entail emphasis on "the use of private sector institutions to deliver program services." The CDSS noted that: "In general, we would look for fewer but simpler projects with the GOP and a greater number of projects with the private sector."

The CDSS also noted that the Mission was in the process of making three changes in program approach: (1) a shift away from the prior geographical focus of the Mission's strategy; (2) greater use of sector analytical techniques to sharpen the focus of policy dialogue and simultaneously identify the highest priority project interventions; and (3) a shift from largely project-oriented assistance to more program assistance in FY 84-86.

Improved agricultural technology development, adaptation, and transfer was identified as a continuing area of concentration in the Mission's agriculture program.

> While efforts to date have emphasized the public sector, the Mission will also stimulate private sector involvement in this area through producer associations, private firms and agribusinesses, especially for diversified crops.

Also planned was an expansion of professional manpower development efforts, with emphasis on managerial and technical training in research, natural resources, and business management, and in strengthening the capacity of local institutions, especially universities, to undertake these efforts. This objective would include increased M.S. and Ph.D. training programs in U.S. universities.

FY 89 (2/88)[4]

This CDSS reflected USAID/Perú's efforts to relate that the Mission's proposed programs aimed to achieve "three of the Goals of the LAC Bureau." Of greatest direct relevance to agriculture:

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[4]This CDSS Update follows up on the CDSS of 1984 and the report "Options for USAID/Peru Program Planning in FY 1986-1987 and Recommended Strategy" (January, 1986), which was submitted in lieu of a CDSS. "This Update serves as the strategy document for the last half of a normal CDSS period. It...proposes a strategy for the next three years" (FY 88-90).

> To achieve the goal of basic structural reforms leading to sustained economic growth, activities are proposed to support the private sector, promote exports, increase agricultural production and manage and preserve natural resources.

The CDSS also related USAID/Perú's recommendation that an "Andean Regional Strategy" be prepared to complement existing strategies for the Caribbean and Central America.

The CDSS notes that the earlier military government "allowed one of the best agricultural education, research and extension complexes in Latin America to deteriorate and shrink, severely limiting the development of and access to new technology." Were additional non-earmarked funding available, the CDSS noted that:

> Expanded agricultural initiatives would focus primarily on activities designed to: increase agricultural exports; augment Mission programs dealing with natural resource conservation and bio-diversity, and strengthen private institutional capacity to deliver quality agricultural analysis and policy. An Agricultural Policy Institute would be the centerpiece of this initiative.

With respect to the Mission's objective of increasing agricultural production, a proposed performance indicator was: "Develop a private sector research and extension network working separately from but in collaboration with the public sector."

> Starting at the beginning of the decade, a major element of strategy has been to assist the GOP to rebuild public sector agricultural education, research, and extension organizations.... A new element now being added to the strategy is to encourage producer associations, regional groups and other private sector agricultural organizations to create their own field research and extension programs, following successful pilot efforts. A more competitive research system using both private and public sector institutions is also being encouraged.

DOMINICAN REPUBLIC

FY 82 (2/80)

This CDSS identifies the USAID/Dominican Republic goal as being

> to improve the living standards of the poor majority.... USAID/DR proposes a continuation of its basic human needs approach to development....

(Note: The proposed strategy makes no reference to assistance for strengthening agricultural research, extension, and/or education.

FY 83 (2/81)

Mission discussions with Government of the Dominican Republic (GODR) officials led to the identification of five principal constraints to development of small farmer agriculture:

1. Policies and practices which result in serious and growing depletion of the natural resource base, particularly soil and water.

2. An increasing and critical shortage of vocational and professional agricultural technicians and administrators in both the public and the private branches of the agricultural sector.

3. A research and extension system inadequate to the needs of small farmers.

4. Growing inability among public sector agricultural institutions to coordinate policies and programs, especially as they become more complex and multi-sectoral.

5. A pricing and marketing system which does not offer equity and incentives, particularly to the small producer

Regarding constraint (3), the CDSS noted that research centers and stations already were in operation, some of which were started with USAID/DR assistance. But the CDSS notes that "the system needs to stress adaptive research, research more applicable to small farms and hillside farms in particular, and to improve and expand extension efforts for small farmers...." The Mission proposed modest investment in this component, especially in adaptive research, and some technical assistance. Also, research and extension activities would continue to be upgraded as specific components of major loans.

FY 85 (1/83)

This CDSS described the Mission's strategy for increasing food production in terms of six major areas of concern to AID/Washington, as follows:

1. Policy Dialogue: This area entailed support for the establishment of a new rural management institute for graduate training of agricultural managers and policy makers.

2. Private Sector: The Title XIII Strengthening Grant Program had assisted interested U.S. universities to establish links with counterpart schools in the Dominican Republic, which resulted in training and research opportunities for the D.R.

3. Technology Transfer: The Mission's objective on the 1960s and 1970s was to train the minimum number of people and establish the institutional framework necessary to carry out a sustained program of technology transfer. The Mission's current objective of increasing food production is based on the transfer of improved technology to

farmers and decision-makers alike. Projects with a technology transfer component include:

a. Natural Resources Management (with components for farming systems research and soil and water resource conservation)

b. Swine Repopulation (OPC

c. Inland Fisheries (OPG)

d. Irrigation Water Management (to demonstrate modern technology for on-farm water management, and to institutionalize research and extension capabilities in this area)

e. Agricultural Sector Training (to focus on graduate training for technical specialists who will be the future researchers of the D.R.)

4. Indigenous Institutions: In the agricultural sector, attention has been focused primarily on educational institutions. Relevant projects include:

a. Rural Management Training (assisted the Superior Institute of Agriculture to develop a university curriculum for developing the management skills of mid-level managers in both the public and the private sector)

b. Agriculture Sector Training (to be used as a vehicle to continue strengthening D.R. universities)

5. Development Training: To provide short- and long-term training in U.S. universities and other international institutions, and to provide in-country training.

6. Food Aid: The CDSS noted that PL-480 Title I proceeds are jointly programmed to support or initiate development activities for which funds are not available through the normal budgeting process. Such activities include funding for research on small animals; development of appropriate technology to increase agricultural productivity; and financial support for research in agriculture being carried out at private universities. The criteria applied to proposed projects required that PL-480 Title I-funded projects relate directly to increasing food production, or indirectly impact positively on increasing total food production.

FY 86 (1/84)

This CDSS noted that USAID/Dominican Republic "strategy involvement over the planning period will draw its major impetus from the now-enacted Caribbean Basin Initiative (CBI), with the major emphasis placed on strengthening the private sector's role in development of the country's resources." Accordingly, the Mission's strategy for agriculture would "focus on increasing incentives to private farmers, reform and reduction of a bloated

and inefficient public bureaucracy, and continued involvement in the protection of the natural resource base so vital to this island's productivity."

To increase investments in agriculture and improve productivity, the CDSS called for "an effective program of agricultural research and extension" for important crops. Despite the GODR's significant investments to develop its research and extension capability, the existing capability is "inadequate to support the needed increases in agricultural production. The cause of this situation has been identified as the inability of the existing public sector system to effectively manage, coordinate, and carry out the required research programs."

As a result, the Mission planned in FY 1985 to finance the Agriculture Research and Extension project. The project's aim is to develop an interdisciplinary private sector research capability in the D.R. "akin to the U.S. Land Grant University research/ extension system." Also, an Agricultural Training Loan would provide funding to train the next generation of agricultural scientists at the M.S. and Ph.D. levels. Further, the Agricultural Research and Extension project would provide small commercial farmer with knowledge of new crops and new techniques, some of which would result in increased exports. Also, research and extension capabilities would be improved through participant training in projects such as the Agricultural Training Program.

HAITI

FY 82 (1/80)

USAID/Haiti's objective for the CDSS period was "to lessen or to eliminate constraints which cause widespread poverty throughout rural Haiti." The Mission sought to increase food production and provide greater access to food by the poor. Among the main constraints identified in a sector assessment were inadequate agricultural research, absence of improved technology, and poor agricultural extension services. It was proposed that the recently redesigned Integrated Agricultural Development (IAD) project would focus research in the Department of Agriculture (DARNDR) to improve the technology available for production of food crops. The CDSS noted that the Small Farmer Production project had provided a better understanding of small farmer agriculture and concluded that future efforts should focus on small farmer multi-crop systems rather than exclusively on single crops.

In extension, the Mission proposed implementing small-scale programs requiring limited investment.

> Efforts to increase the quality of food produced will concentrate on extension and nutrition education and training activities to encourage the cultivation of more nutritious food crops, usually in kitchen garden-type arrangement for home consumption, as well as tree crops and small livestock.

However, the DARNDR had shown little interest in this type of program; accordingly, the bulk of the Mission's assistance in this area was to be in the form of small-scale programs by

PVOs to develop successful approaches to this type of extension and nutrition education effort.

The CDSS noted that:

> The language, cultural and political barriers to broader Haitian participation with the predominantly English-speaking Caribbean are considerable. Without greater initiatives on the part of regional organizations such as the Caribbean Development Bank and CARICOM, Haiti is not likely to participate more actively in regional programs.

FY 83 (1/81)

This CDSS noted that, with the poor performance of the GOH during the last year

> on almost all of the commitment indicators...and the resulting poor macro-economic picture and continued delays in project implementation, we cannot now support the expanded performance program.... While we have not been remarkably successful at encouraging major policy or macro-economic reforms with our assistance program in the last year, we believe it is premature to write these efforts off and believe that through continued discussions in these areas we may be able to influence the GOH in positive directions. Therefore, we have concluded that the minimum program alternative is not the correct approach at this time, either. Consequently, we propose adoption of the selective performance program for the time being. This will permit us to continue our relatively successful efforts in rural credit, malaria, family planning and road construction and maintenance, to start new non-governmental programs in agroforestry and labor intensive rural works, and to continue our efforts to implement major programs with the GOH in agriculture (Integrated Agricultural Development) and health (RHDS).

FY 84 (1/82)

This CDSS stated that "food self-reliance" in Haiti needed to be based, similar to other economically successful, relatively small countries, on "a heavy but not exclusive reliance on international trade." As the CDSS noted, Haiti

> will never be able to produce, at any reasonable cost, a commodity like wheat in sufficient volume to satisfy domestic demand. Conversely, Haiti's agricultural hinterland is capable of mobilizing its comparative advantage for the export of tropical agricultural products to larger food markets, while expanding production of many staples of local production through improved varieties of products such as cassava, taro, beans and peas, hybrid corn and improved sorghum.
>
> Therefore, agricultural production for <u>both</u> domestic consumption and export must be pursued. Certainly, the production of the subsistence foods of the poor (corn, sorghum, pulses and tubers) which are produced and consumed domestically must be

improved. Nevertheless, long-term food self-reliance requires a more effective integration of tropical specialty lines and tree crop items for export with these domestic food items if Haiti's farming systems are to be ecologically and economically viable for the long term.

The CDSS added that the Ministry of Agriculture "has been building, with USAID and other donor assistance, a cadre of technical personnel capable of improving farming research and extension efforts that will permit the Haitian peasant and small plantation owner to apply improved technology for sustained increases in production and income." But most of this improved capacity was still concentrated at Damien; if the capacity is become a delivery system, the essential next step would be decentralization to field stations.

The CDSS identified the research and extension component of the Integrated Agricultural Development project (PDAI) as the most successful activity. As a follow-on to PDAI, an expanded program of staple crop improvement would be developed as top priority.

This will include the expansion of an adaptive research and extension program using on-farm trials, field verification and training to introduce improved varieties and cultivation practices. The focus will be on improvement of yields of cereals, pulses and root crops on small farmers. This would be designed as a "field project", with a strengthening of the Ministry of Agriculture's capabilities in these areas resulting from the actual execution of such a field project with the assistance of U.S. advisors.

Regarding agricultural education, the CDSS noted that the training components of the major Mission projects in all sectors as well as several non-project training programs under regional or central funding provided "substantial opportunities for the professional training of Haitians involved in specific development-related disciplines." The major institution-strengthening projects in the agriculture sector (PDAI, Rural Credit) had provided both short-term and long-term training to Haitian counterparts, mostly in-country, in agricultural research, resource management and planning, agricultural economics, agricultural engineering, horticulture, rural credit, and financial management.

Note: In 1982, the U.S. Congress mandated that AID implement its projects in Haiti "to the maximum extent possible" through PVOs. In 1985, a GAO team reviewed the PVO strategy and concluded that, although it had some drawbacks, the approach was generally successful. The GAO recommended that AID continue to examine projects "on a case-by-case" basis to select the most appropriate organization (PVO or GOH) for implementation.

FY 86 (Supplement to FY 84 CDSS) (1/84)

This CDSS stated the Mission's objectives in agriculture and rural development as being

(1) to increase the agricultural production of commodities that maximize Haiti's comparative advantage and improve access of the poor to a reliable and adequate food

supply; and (2) to reduce and ultimately reverse the process of deforestation and soil erosion.

To achieve these objectives, the Mission's strategy provided for a number of elements, including:

1. Commodity Studies: Undertaking a series of studies to identify pricing, marketing, taxing and other constraints to increased production of tree and other cash crops.

2. Upgrading Agricultural Personnel: Improving the Ministry of Agriculture's capability to serve small farmers through applied food crop and farming systems, including both on-the-job and formal training in research, extension, data gathering and analysis, and credit.

3. Non-Government Organizations: Expanding the involvement of non-governmental organizations (cooperatives, pre-coops, credit associations, PVOs and private investors) in agricultural and livestock production, processing, marketing and technology transfer to small farmers.

4. Tree Crops: Promoting both research and production of tree crops to meet income, food, conservation and energy needs. Such crops include tropical fruits and nuts, cacao, coffee, and a variety of fast-growing species suitable for lumber and fuel uses.

Revised Strategy Paper for FY 89/90 (not a CDSS; a full CDSS is planned for FY 91) (11/89)

U.S. assistance to Haiti was suspended during most of "Papa Doc" Duvalier's reign, then reestablished in 1973 during the "Baby Doc" period. However, in 1980, emphasis was shifted to working primarily through PVO/NGO channels.

In agriculture, the Mission's strategy is aimed at promotion of sustainable production systems on the hillsides based on integration of sound soil and water conservation systems using perennial crops; and expansion of market opportunities and support to small farmers for products with identified market demand.

JAMAICA

FY 82 (1/80)

Despite substantial U.S. and other donor assistance since 1977, the Jamaican economy was continuing to deteriorate at the outset of the 1980s. Recognizing that USAID/Jamaica did not have the resources required to solve Jamaica's problems in the short run, the Mission charted a course to provide assistance aimed at longer-range development, focusing on the productive rather than the social sectors. "The aim will be to create or strengthen institutions and establish conditions necessary for sustained development once the economy has turned around." The Mission's objective in the agriculture sector was "to help increase food

production among small farmers and the quality of life of rural families." Aiming to achieve sustained increases in production on farms of 1-10 acres in size, the Mission sought to help the Government of Jamaica (GOJ) to:

> (a) analyze and respond to changing problems of the small farmer; (b) ensure that productivity gains are maintained; and (c) develop technological innovations and policies in response to evolving conditions in the rural sector.... Currently, the key constraints requiring attention in priority order are: administrative capability, soil conservation, marketing, research, extension, and education.

Within the areas of research, extension, and education, the CDSS noted that the GOJ's research capacity is inadequate

> to deal with the agronomic problems of the island. What little research exists is conducted by the MOA [Ministry of Agriculture] and the statutory boards. Research has historically focused on export crops and livestock. The MOA has one hundred professional and sub-professional positions in research of which only twelve are devoted to agronomic problems. Little coordination exists in agriculture research and there are few linkages between extension and research activities. The Jamaican campus of the University of the West Indies does not have an agricultural college and does a very limited amount of agricultural research. There is no research which focuses directly or uniquely upon the problems or constraints of the target group.

The GOJ extension field staff had approximately one agent per 500 farmers, with agents having received their training primarily at the theoretically-oriented Jamaica School of Agriculture (JSA). Most agents came from non-rural backgrounds which, given the lack of applied training, limited their effectiveness to deal with agricultural problems. Yet the GOJ's integrated rural development program was increasing the need for extension agents to be able to move about in the rural areas.

With respect to agricultural education, the CDSS noted that the educational curriculum for people trained for the agriculture sector needed to be revised. The JSA, at the time of the CDSS, was under the Ministry of Education which saw JSA primarily as an institution to train secondary level agricultural teachers. The CDSS noted that the GOJ's Five Year Plan includes an emphasis on agricultural education and that studies are underway to determine specific needs in agricultural education. The CDSS indicated that the Mission expected that assistance to agricultural education would form part of future agriculture sector lending. Already, through the Rural Education project,

> a prototype secondary agricultural school [had been] constructed and [begun to operate] in February 1979. Students were enrolled from all parts of Jamaica, and through self-help efforts were able to clear land, initiate animal production, and plant a variety of crops. In less than a year, the school was able to feed itself in poultry and pigs and was selling chickens, eggs, peanuts and other produce.

At the time of the CDSS, the Mission was studying the problems of the agricultural research, extension, and education system under a Title XII program. A recently completed baseline study by the University of Kentucky recommended focusing upon the problems of the JSA as the first step in addressing the long-run constraints on agricultural research, extension, and education. The CDSS also noted that existing projects (e.g., Integrated Rural Development) had components addressing research and extension constraints. The CDSS indicated that the Mission planned to expand into agricultural research, extension, and education, and especially the linkages among them, in 1981. The CDSS noted the Mission's desire to expand the capacity of the GOJ in adaptive research, to expand already existing regional training at the JSA, and to develop a regional center of expertise on solving the problem of small hillside farmers in the Caribbean. The CDSS also noted the initiatives underway to develop agricultural exports (traditional and non-traditional) and to address problems relating to natural resources and the environment.

FY 83 (1/81)

This CDSS stated that for Jamaica, as for other small island economies,

> there is no viable alternative to vibrant, outward looking, private-sector led growth. The new Jamaican government has firmly committed itself to that path.... The most important bottlenecks to economic recovery and growth are in the productive sectors and in the area of public management and administration, not in the social or basic human needs sectors.

In the agriculture sector, the CDSS noted that, over "the next few years," the Mission would "concentrate on the key agricultural education, research, and extension services which must be improved if agricultural growth is to be stimulated." The Mission proposed to start with the JSA, the only institution in Jamaica that was graduating trained agricultural personnel above the high school level. The CDSS noted that the Ministry of Education, under the Rural Education Sector Loan, had established two secondary level agricultural schools; and one school already was graduating students whose level of preparation and motivation had impressed employers. However, the success of the secondary agricultural schools had the effect of creating pressure to upgrade the JSA. As the CDSS noted, "unless the calibre of education at JSA is raised substantially, the MOA will not be able to improve its research and extension programs." The CDSS noted that the Mission planned, as a complement to or a follow-on to project assistance to JSA, to provide assistance in the research and extension areas.

Further, the CDSS noted the potential for Jamaica, with a wide variety of ecological zones involved in agricultural production, "to benefit from and to participate in regional initiatives to solve common Caribbean agricultural problems."

FY 84 (1/82)

Per AID/Washington guidance, the 1984 CDSS focused primarily on analyzing Jamaica's short-term economic and structural adjustment problems and the strategy

USAID/Jamaica proposed for bringing AID resources to bear on these problems. The CDSS noted that the revised FY 83 CDSS had been completed a little more than six months prior to the present CDSS and that there was "little, if any significant change in AID program beneficiaries, development problems and their causes, etc., since the last several CDSS documents were written."

FY 85 (1/83)

This CDSS, in its discussion of Mission strategy and support for agriculture and rural development, pointed to the role of the Agricultural Education project in enhancing Jamaica's capacity to produce better trained agricultural personnel for the private and public sectors at the post-secondary school. Further, the CDSS indicated that:

> In the more distant future, a program will be developed to deal with the special problems of hillside farmers...and how to improve their production capacity and incomes in the context of watershed management.

FY 86 CDSS Update (1/84)

This CDSS reported that the USAID/Jamaica program strategy, explained in detail in the FY 85 CDSS, "is still valid." However, the CDSS noted, "the GOJ has been reluctant to allow free market forces to determine the allocation of resources within the private sector" and, as a result, AID policy dialogue increasingly "must focus on influencing GOJ economic policy actions prior to the provision of additional resources." In the area of agriculture, the CDSS referred to the "development of a revised agricultural production strategy for hillside farmers." While other donors have provided assistance in agricultural research (e.g., the Inter-American Development Bank), the CDSS noted that "this area remains weak due to inadequate political support."

FY 89 (3/88)

The Mission's proposed FY 1989 program in agriculture sought to increase agricultural production. The proposed strategy emphasized (1) increasing exports (traditional and non-traditional) and employment and (2) raising incomes of poor, principally hillside, farmers, while conserving fragile lands. USAID/Jamaica's initiative focused on coffee and cocoa producers as part of the Hillside Agriculture project. The primary reason for hillside erosion is annual cropping; accordingly, Hillside Agriculture was designed to promote conversion to tree cropping to increase incomes of poor hillside farmers and sustain the ecology. As part of this initiative, the CDSS recognized the importance of developing appropriate technologies.

> The Hillside Agriculture Project addresses this need through extension, with adaptive research performed by a variety of indigenous public and private organizations. Similar interventions may be justified for lowland producers. The Mission is looking at ways to improve public and private institutional capability to carry out this role, and agricultural education initiatives will also support it.

The CDSS also noted that the Mission was supporting diversification of exports through a number of initiatives (e.g., Agro 21, agricultural research activities, and several farmer organizations). "The Mission will support non-traditional crop exports by helping increase market share through support services to improve productivity and marketing efficiency."

Regarding institutional support for traditional crops, the CDSS noted that the restructuring of the marketing boards separates their "technology generation and transfer functions from marketing, but those critical services may not be supported adequately. The Mission plans to support technology development and transfer systems in the public sector with a policy oriented project."

REGIONAL DEVELOPMENT OFFICE FOR THE CARIBBEAN (RDO/C)

FY 82 (1/80)

This CDSS noted that the goal of USAID's Regional Development Office for the Caribbean (RDO/C) is "viable, progressive, democratic societies in which the basic human needs of all citizens are met." RDO/C's strategy is:

> to encourage the formulation of complementary regional and national policies and selectively to aid programs essential to achieving them, strengthen regional development institutions, support appropriate common services for the mini-states of the Eastern Caribbean, foster increased cooperation among all English-speaking countries and promote collaboration over the longer term among the English and non English-speaking countries of the region.

The strategy initially focused principally on the Commonwealth Caribbean with special emphasis on the Eastern Caribbean, this reflecting that local initiatives in regional cooperation are found predominantly among the English-speaking countries.

In agriculture, an "agricultural development strategy based upon the provision of common technical services, shared pools of experts and investment capital through regional institutions has been initiated to reduce the decline in agricultural production, employment, rural incomes and at the same time alleviate the constraint to economic growth caused by increasing food imports." Among the problem areas in agriculture to be addressed by the Mission in a phased multi-year program were:

1. Research: An on-going RDO/C project assists the Caribbean Agricultural Research and Development Institute (CARDI) to strengthen its applied research capacity directed towards small farmers. CARDI has established country teams in the countries of the region and begun adaptive on-farm research directed toward increasing the productivity of multiple cropping systems. Additional research initiatives were to be considered during the CDSS period (FY 82-86) to further strengthen CARDI's work on small farm systems.

2. Extension: A FY 80 Title XII project involving MUCIA would assist the development of national agricultural extension services as well as the regional extension outreach capacity of the University of the West Indies (UWI). The project is linked to the CARDI Multiple Cropping Systems Research project via national and regional coordinating committees. For the FY 82-86 period, efforts were to be concentrated on improved delivery systems for providing information on farm credit, improved farming techniques, new crops, and marketing opportunities for small farmers.

3. Education: The CDSS notes that, throughout the Caribbean, the heritage of plantation farming based on slavery still negatively affects the perceptions of today's youth toward opportunities in agriculture. The Mission indicated that it would examine ways to develop constructive agricultural education institutions and programs. In this regard, the Mission planned to conduct an analysis and rationalization of agricultural education at all levels of the education system, including the preparation of agricultural teachers.

FY 83 (2/81)

This CDSS identifies the strategic objectives of RDO/C's agricultural program as being "to increase the per capita output of food and other marketable commodities, and to expand employment opportunities for rural families, thereby increasing farm family income." The strategy to achieve these objectives involved two parallel areas: (1) increasing traditional export commodities, and (2) promoting commercial agricultural diversification both to achieve greater food production for regional requirements and to establish new commodities aimed at extra-regional trade. This strategy is to be implemented through two different methods:

> The first method promotes incremental change in existing agricultural sub-systems. For example, research, extension and credit-related projects are essentially designed to improve ongoing activities. The second methods seeks to establish radical innovations in existing sub-systems where bottlenecks exist. For example, the establishment of regular inter-island sea transport services....

The CDSS noted the Mission's continued support for research and extension for the FY 83-87 period; further, the CDSS noted that RDO/C would examine ways to assist development of national agricultural education and training institutions and programs. "Agricultural education, mentioned in last year's CDSS, will be addressed within the context of existing programs and planned new initiatives." Examples cited were the St. Lucia Youth Development Program for out-of-school youth, which includes training centers both for agricultural production and agro-processing; the proposed extension to the senior level of the UWI Primary Education Regional Project includes an introduction to agricultural training as part of its pre-vocational activities; the USAID/CXC Secondary Education Project is developing a course in Agricultural Science for students at the secondary level throughout the English-speaking Caribbean region; and the UWI/USAID Faculty of Agriculture project provides for the preparation and upgrading of agricultural extension staffs in the region.

Finally, a study of agricultural manpower supply and demand is being planned to determine additional activities to be undertaken to rationalize and enhance agricultural education in the region.

FY 86 (9/84)

This CDSS identified the goals of RDO/C's agriculture and rural development program as: (1) to increase rural family incomes by upgrading agricultural productivity among commercial small farmers and (2) to increase food production and agricultural exports. The Mission's strategy of increasing production of export commodities and promoting commercial agricultural diversification seeks "to reduce the food import bill and to establish new commodities aimed at export trade." In agricultural research and extension:

> The twin programs of farming systems research by the Caribbean Agricultural Research and Development Institute (CARDI) and extension through the Title XII project with the Mid-West Universities Consortium in International Activities (MUCIA) and the University of the West Indies (UWI) are expected to achieve measurable results during the planning period that will show up in increasingly diversified production profiles and reduced food imports particularly from extra-regional sources.

Compared with previous CDSS documents, this CDSS did not address agricultural education, although reference was made to human resource development being addressed under a number of projects and programs, some of which include opportunities for degree training in agriculture.

BELIZE

FY 85 (8/83)

Belize achieved its independence in 1981 and the USAID/ Belize Mission was established in January 1983. This CDSS proposed, among other initiatives, a program to diversify agricultural production and increase agricultural exports:

> AID's principal assistance in diversifying the economy will be a specific program to develop viable crop/livestock options that move the rural sector and the economy away from the current degree of dependence on sugar. Programs in private sector export and development, public sector planning and management, and other aspects of rural development also will make important contributions to this component of the overall strategy.
>
> AID's assistance will be directed toward developing crop/ livestock production options that compete with or displace sugar production. Vegetable oil seeds, bananas, fresh or processed fruits and vegetables, pork production and processing and other possibilities will be explored and incentive and support systems created to encourage the best prospects to be pursued....

> Assistance will be given directly to commercial and industrial firms to help them identify and implement import substitution, economic diversification and new export activities. Technical assistance, for example, will be given to existing or new industries, or industry groups in the form of research and studies, training, brokering of joint ventures, market development, etc....
>
> In assisting the public sector, emphasis will be placed on two areas—1) policy and planning, and 2) management development and training....
>
> .... Efforts to expand small farmer output and productivity, including some diversification (e.g., in soybeans), also will support the overall diversification effort.

No specific references are made in the CDSS to the existence of and/or Mission strategy vis-à-vis agricultural research, extension, and/or education. An annex on the agriculture sector notes that the Caribbean Agricultural Research and Development Institute (CARDI), a regional body which assists with the development of agricultural research in the Caribbean countries, operates a small research station near Belmopan which has tested, among other things, various varieties of soybeans, vegetables, and corn for adaptability in Belize. However, this annex notes:

> There are some constraints...to increasing...production. Although basic adaptive research by CARDI has identified suitable cultivars...for Belize, there has been little on-farm research to identify how such crops might best fit into the various farming systems that exist. The extension system needs bolstering in both technical capacity and credibility if widespread adoption of optimum production practices of new crops is to be achieved.

The CDSS sectoral analysis of agriculture stated that the public sector

> provides inadequate and sometimes inappropriate support to the agricultural sector. Allocations of financial, physical, and personnel resources are often inadequately planned and sometimes misdirected. Belize has not formulated a coherent agricultural development strategy with well-focused and clearly defined priorities.

With respect to agricultural education, the CDSS noted that: "Rural agricultural...skills are not given much attention."

> One exception to this is the Rural Education and Agriculture Program (REAP) which has now spread to 23 primary schools and aims at the early development of favorable attitudes towards, and relevant skills in, agriculture.

FY 86 (4/84)

This CDSS identified USAID/Belize's strategy as focusing on economic stabilization and long-term growth in agricultural production, export promotion, and human resources development. The CDSS notes that a constraint to agricultural production is the

lack of an effective adaptive research program... While some research is being carried out, there remains a need to intensify the effort and develop a much closer relationship between research and extension.

The Mission proposed an Agricultural Production and Diversification project for the period 1985-89.

> Phase I will focus on strengthening the Ministry of Natural Resources' capacity for adaptive research coordinated with extension. Potential alternative crops domestic consumption and export will be investigated.... Phase II, while continuing to support adaptive research, will be more heavily focused on field trials and extension of crops developed under Phase I.
>
> Only one donor-financed activity—[the Caribbean Agricultural Research and Development Institute]—has been involved in applied research by screening and selecting crop varieties with potential in Belize. However, this activity needs to be accelerated and institutionalized within GOB agricultural programs.... Research and extension activities will have to be combined under one institution.

Further, under a proposed Farming Systems for Milpa Farmers project, the Mission proposed establishing "a farming systems department within the new national research and extension organization."

COSTA RICA

FY 81 (1/79)

This CDSS identified the objectives of USAID/Costa Rica's program as follows: (1) increase poor people's access to the factors of production; (2) increase production and productivity in a manner consistent with objectives 1 and 3; (3) reverse natural resources degradation; and (4) decentralize development by promoting activities in lagging regions, in accordance with objective 3. "The linchpin among these objectives is No. 2, because only by concentrating on the productive sectors can Costa Rica's progress be made permanent."

The CDSS did not make specific reference to agricultural research, extension, and/or education, although the "Proposed Assistance Planning Level" (PAPL) summary proposes new projects in Agricultural Diversification and Science & Technology that would include technology transfer and technical education.

FY 82-86 (1/80)

This CDSS modified sub-objective 4 of the previous CDSS so that it read: "Decentralize development by promoting activities in lagging regions, when this is in accord with the second objective, and by increasing community-level participation in development planning and project execution."

With respect to sub-objective 3, the CDSS noted that the Mission's strategy "is to help the [Government of Costa Rica (GOCR)] develop the capability to design and implement appropriate and cost-effective, multi-disciplinary natural resource conservation programs and to ensure that other development efforts are environmentally sound."

With respect to sub-objective 2, the Mission's strategy is to "support...the GOCR's expansion of agro-industrial activity and...small farm technology research and extension to diversify agriculture, to generate employment in both rural and urban areas and to reduce the relative importance of low value-added, import-substituting industrialization."

The PAPL summary identified a "Small Farmer Research/ Extension" project (but no additional information is provided).

FY 85 CDSS Supplement (n.d.)

This CDSS cast the Mission's strategy in terms of six strategy elements: policy reform, private sector development, institutional development, research and technology transfer, participant training, and food aid. In the area of research and technology transfer, the CDSS stated that the Mission's strategy was "to promote the creation, transfer, adaptation, dissemination, and utilization of more appropriate technologies and methodologies largely through...institutional development mechanisms."

With respect to agricultural research and technology transfer, the Mission planned:

> to undertake studies to identify the origin of agricultural production and productivity constraints for specific crops including grains. These studies will permit the Mission to assess whether the constraints arise from agronomic/climatological conditions, lack of applicable research results, and/or deficiencies in the agricultural extension system and to direct future assistance efforts accordingly.

The CDSS noted the possibility of a future loan in agricultural technology extension. Such a loan would "support activities which link academic research findings with the producers needing that information."

The CDSS also indicated that the Mission needed to evaluate carefully

> requested and planned activities which are directed at improving the research and technology transfer system such as: the use of innovative communications techniques by the Ministry of Agriculture and Livestock's extension service under the Northern Zone Infrastructure Development Project and the strengthening of private sector controlled agricultural producers associations to serve as technology transfer mechanisms to farmers in the case of non-traditional export crops. The success of these analytical efforts may point the way in the outyears for an expanded involvement in agricultural technology/extension activities.

FY 88-92 Strategy Update (3/88)

This CDSS further developed the Mission's Nontraditional Agricultural Export (NTAE) strategy. The achievement of "sustainable growth in non-traditional exports," the CDSS noted, will require (1) macroeconomic stability, especially in terms of the policy environment; (2) increased investment, domestic and foreign; and (3) increased productivity and marketing ability. "Helping to assure that these conditions are firmly established will continue to involve the majority of Mission program and policy dialogue efforts, as well as staff resources and management time."

In regard to "increased productivity," the CDSS stated that increasing the production of nontraditional crops for export requires

> expanding the production of nontraditional crops already being produced in country, as well as introducing new crops and technology...this also means crop diversification, which is essentially an investment decision. But before the farmer is likely to diversify his crop, he will want to know that he can profit from the shift—that there is a market for the product, and whether and how it can be best grown in Costa Rica.... Currently there is not sufficient information on these topics.

In response, the Mission's NTAE strategy provided "for selection of two to four products per year and provision of intensive technical assistance to selected groups of producers in all areas of identified product constraints."

In the area of agricultural education, and looking to the longer-term technical human resource needs of the agriculture sector throughout the region, the CDSS indicated that the Mission would continue implementing the Regional Agricultural School for the Humid Tropics (EARTH) component of ROCAP's Regional Agricultural Higher Education project.

> The college, which will be located in Costa Rica, will develop professionals capable of working in the private and public sectors at all levels of agriculture; from seed and food production to marketing, storage, processing, export, and credit. The existence of such a resource base is important to continued development and adaptation of technologies for increasing the productivity of agribusiness in the region. Further, by teaching how to most effectively and efficiently maintain the natural resource base, the project will contribute to...natural resources management objectives....

EL SALVADOR

FY 82 (1/80)

During this CDSS period, the Mission's "primary effort will continue to be to help the government provide employment and income." The Mission proposed to address the objective of employment and income generation "through increased small enterprise creation and support, labor intensive public sector projects and small farm production." The third of these components entails assisting "on-farm enterprises to add value to their production

and/or supplement incomes with cottage, artisan or other productive work." The emphasis in assistance was to be on promotion of exports. Within the area of small farm production, the CDSS indicated that the Mission would "seek to refine conservation practices to site specific circumstances and to introduce higher value crops, varieties and cropping systems." The CDSS indicated that the Mission could not be more specific about implementation of this strategy because of uncertainty about how the agrarian reform movement would develop.

FY 84 (1/82) (not available)

FY 90-94 (final-6/89)

This CDSS, in its discussion of constraints on the factors of production, stated: "After almost eight years of uncertainty and restrained public and private investment, El Salvador's technology stock has been depleted." The objective of the Mission's agricultural strategy is "to increase, via enhanced productivity and production, the income of the rural poor and increase the agricultural sector's foreign exchange contribution to the economy." The Mission's strategy focuses on diversification via non-traditional agricultural export development to assist

> agribusinesses—processing and marketing firms—overcome technological constraints and link these agribusinesses with small farmer and cooperative producers. Although the target group for these activities will be small farmers, USAID will use agribusiness investors as implementers of the strategy. These implementers will pass on credit, technical assistance, plant materials and market information to small farmers who, in addition to their basic grains will be able to plant off-season, high value crops for sale and export. The benefits deriving from these agribusinesses are expected to multiply quickly as growing export sales increase the demand for raw product. This will generate employment in processing and expand opportunities for small farmers to supply production.
>
> This approach recognizes that agribusinesses are innovators and diffusers of technology and that small producers of basic grains are constrained by the limited, rainy season crops they have traditionally produced. It utilizes those who have vested interests in assured quantities of "market quality" production to transfer technology which will increase the intensity with which the small farmer uses his land and labor. It will improve economic opportunities for farmers who have traditionally produced for subsistence, entering the market only when a surplus resulted. With new markets and technical assistance provided by the processors and marketers of non-traditional agricultural export crops, subsistence farmers can fully utilize their land and family labor resources and earn important new cash incomes. In this manner, agribusinesses will provide income opportunities to those otherwise unable or less willing to invest in risky ventures.

In traditional export crops, the CDSS noted that the Mission would continue and expand support to the Salvadoran Coffee Research Institute (ISIC) to enhance production through better plant material and improved disease control; once policy adjustments have

been made, the Mission also plans to improve production through a private sector coffee producer group or cooperative federation.

Further, the Mission's small farmer program includes support for the development of new varieties of basic grains, certified seed production, and research on fertilizer use and soil erosion control. The Mission stated: "Our counterpart funding is also financing the decentralization of the Ministry's extension services and the creation of community level extension agencies to better serve the small farmer."

In non-traditional agricultural export (NTAE) crops, the Agricultural Diversification Program (DIVAGRO) of the Mission-supported Salvadoran Foundation for Social and Economic Development (FUSADES) is working with agribusinesses and farmers to develop technology generation and transfer to support the production and marketing of NTAE crops.

In agricultural education, the Entrepreneurial Foundation for Educational Development (FEPADE), established with AID funding in 1986, will expand its educational credit program for needy students enrolled in priority vocational/technical programs. It will also help to upgrade the capabilities of vocational/technical schools through the provision of teacher fellowships and grant resources to expand facilities. The Mission also will support the efforts of other private organizations such as FUSADES to provide short and long term training in professions related to priority sectors (e.g., irrigated agriculture).

While no mention is made in the CDSS to the National School of Agriculture (ENA), the CDSS does mention the National Center for Agricultural Technology (CENTA) of the Ministry of Agriculture and Livestock (MAG) in connection with the Mission's program of support for natural resources management. The CDSS notes that the Generation of Employment project provided support to CENTA to carry out wildlife management activities and germplasm conservation; however, the project ended in FY 1986.

With respect to natural resources management, the CDSS notes that:

> A shortage of well-trained staff is an impediment to the implementation of natural resource management programs in El Salvador.... There is an urgent need to upgrade professionals and technicians in a broad range of environmental and natural resources fields, and to generate a critical mass of trained technicians in selected fields for sustained action. USAID will provide technical assistance and training to strengthen public and private institutional capabilities in natural resources management, particularly in land-use planning, forestry, soil and water conservation, watershed management, and management of wildlands and protected areas.

Further, the CDSS notes:

> The task of reaching and teaching small landholders proper land use management techniques is difficult. The weakness of government institutions in charge of extension, such as CENTA,...make[s] the effort to change the behavior of small landholders challenging. Yet the need for such efforts to promote proper land use

and agriculture practice is great. To work towards the above objective, USAID will work through service cooperatives to provide training in simple farming systems and resource management techniques of benefit to small landholders, i.e., soil and water conservation techniques, pasture management, agroforestry, mixed cropping, and integrated pest management.

GUATEMALA

FY 82 (1/80)

This CDSS stated that USAID/Guatemala's development assistance strategy is "to assist the GOG [Government of Guatemala]...to increase the income and satisfy the basic human needs of the AID target group."

> The target group...reflects a further geographic concentration over last year's CDSS. The Mission made a conscious decision several years ago that AID programs could not reach all of the poor in Guatemala.... In 1976 we chose the poorest 206 municipios.... Because of the funding constraints foreseen for FY 1980 and 1981, we have been forced to narrow the target group to the poor living in 140 municipios in the Highlands and those who choose to migrate to colonization areas in the Northern Transversal Strip and the Peten.... The reduction in geographic coverage also accords with the Mission's integrated development approach by permitting greater spatial concentration and complementarity of resource investments.

The Mission's goal, among others, was to: (1) increase the productive resource base of the target group; (2) increase the efficiency of the target group in the use of its productive resources; and (3) increase the access of the target group to relevant social services.

With respect to the second goal, an important determinant of efficiency is application of appropriate production technology. Accordingly, the Mission's strategy "places heavy emphasis on research and development of technologies appropriate to farm and non-farm production." Given the potentially higher returns to labor of fruits, vegetables, and certain livestock enterprises, the Mission programmed assistance to support GOG research and development of production and farm management technologies for these crops. Also, to develop the human resources in the target area, the Mission programmed assistance to support a broad range of non-formal education and extension programs.[5] Further, the Mission planned to assist the GOG in improving the capacity and effectiveness of the Ministry of Agriculture to disseminate information on improved farm production and management technologies, particularly for diversified crop production.

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[5]In 1973, the LAC Bureau initiated a successful pilot Basic Village Education program which was followed by an expanded program in non-formal education underway at the time of this CDSS.

FY 84 (5/82)

This CDSS articulated the same strategy vis-à-vis increasing agricultural productivity as presented in the FY 82 CDSS. With respect to assistance in building institutional capacity, this CDSS indicated that:

> New projects to be implemented over this planning period will develop the ability of host country institutions to carry out research and disseminate information on appropriate technologies on diversification of small farm production, tropical agriculture, environmental protection, small-scale energy (principally of renewable source), and enhancing the role of women in the development process.

Further, the CDSS noted that the Mission would "attempt to improve the process of implementation through recommending appropriate administrative changes necessary for host country institutions to increase their effectiveness."

FY 86 (4/84)

This CDSS stated that increasing "rural incomes and productivity, principally through higher agricultural productivity," would be the "the major focus of U.S. assistance efforts over this planning period." Of the major agricultural zones in Guatemala, the most important for the USAID/Guatemala strategy is the Western Highlands (or *Altiplano*). This is an area well suited to

> the profitable production of temperate fruits and vegetables. As such, it is clearly not meeting its productive potential. The Strategy will attempt to introduce new technologies and cash crops together with other appropriate market mechanisms to raise productivity and incomes. USAID will emphasize...small commercial and potentially commercial farmers and will work on both technological innovation and infrastructure and marketing improvements necessary to raise productivity and incomes.

Further, the strategy "will include applied research and development of technologies appropriate to...production..., especially those that are related to farming alternatives which offer greater opportunities for more intensive use of labor and higher returns per unit of land employed." To support this program, the "GOG will be expected to place greater emphasis on agricultural research and the development and application of technology utilizing both public and private sectors." For example, the CDSS noted that

> the extension services of DIGESA will be important in the dissemination of technologies developed and adapted by ICTA, the agricultural research institute. The Strategy recognizes the need to strengthen institutions of this nature and calls for USAID projects which will improve the planning, management and evaluation capabilities of public sector organizations with emphasis on development of the necessary linkages among farmers, extension service and research institute. Therefore, institution building will be an integral part of all activities undertaken over this planning period.

The CDSS also defined a role for PVOs: "Increasing agricultural productivity will be a key area of U.S. assistance to PVOs over this planning period. The focus will be on small commercial or potentially commercial farmers."

USAID/Guatemala Agriculture Sector Development Strategy (FY 1988-1992) (2/88)

This strategy document identifies "technology development and dissemination" as well as "agricultural education and training" as two of the five institutional constraints to more rapid agricultural development. The document defines sector goals and strategy for agriculture (subsistence and commercial). At the time of this strategy statement, USAID/Guatemala had one project (Small Farmer Diversification) in the area of agricultural research and extension. But agricultural research and extension activities were to be expanded under the broadened Highlands Agricultural Development (HAD) project, providing additional support to ICTA and helping to establish a private research foundation for diversified crop technology development, with an emphasis on integrated pest management. Further, a new Technification of Traditional Export Crops project, to be initiated with the private sector in FY 89, was to develop and disseminate improved production and processing technologies for permanent export crops for small producers. DIGESA and DIGESEPE were to continue to receive support under the expanded HAD project in the transfer of appropriate crop and livestock technologies.

The strategy also recognized the need for "institutional strengthening and reorganization." Agricultural research and extension are identified as areas which are strong candidates for budgetary support by priority areas and institutions. ICTA needs greater budgetary allocations to hire and retain more qualified research technicians, carry out more extensive high-priority crop variety trials, and increase integrated pest management research. Increased budgetary resources would enable DIGESA and DIGESEPE to increase audio-visual materials for farmer use, increase farmer training courses, and provide increased support to the Ministry of Agriculture's 3,700 grassroots extension workers (representantes agropecuarios).

The Agriculture Sector Assessment identified the following USAID/Guatemala and Regional Office for Central America and Panamá (ROCAP) projects as addressing constraints in agricultural research and extension in Guatemala:

ROCAP (0083)	Small Farm Production Systems (CATIE)
ROCAP (0089)	Fuelwood and Alternative Energy Sources (CATIE)
ROCAP (0090)	Regional Coffee Pest Control (IICA)
ROCAP (0116)	Technical Support to Food Assistance (INCAP)
ROCAP (0127)	Regional Alternative Technology Network (CATIE, IICA)
USAID (0272)	Integrated Rural Development (HOPE)
USAID (0255)	Small Farmer Diversification Systems
USAID (0381)	Technification of Traditional Export Crops
IDB (473/OC)	Technology Development, Transfer and Seed Multiplication (PROGETTAPS)

Projects addressing education/training constraints were:

ROCAP (0129)	Regional Agricultural Higher Education (CATIE)
ROCAP (0130)	Central American Peace Scholarships (CAPS)
USAID (0281)	Non-Formal Education
USAID (0304)	Altiplano Higher Education
USAID (0362)	Central American Peace Scholarships (CAPS)

FY 90-94 CDSS Update (12/88)

This CDSS basically reviewed the February 1988 USAID/ Guatemala Agriculture Sector Strategy document approved in Washington in mid-1988. The CDSS noted that agricultural technology development and transfer services provided through the private sector are concentrated on a few specific crops and directed toward the larger commercial producers. On the other hand, the vast majority of small farm owners/ operators are dependent upon government agencies and resources for research and extension. Resources have been limited and historically have been channeled into the area of basic grains, to virtual neglect of the rest of the sector. The effectiveness of the Agricultural Science and Technology Institute (ICTA) has been constrained by a limited budget, slowness to adjust to non-traditional crop research needs, and reduced outreach capability. Private traditional crop producer associations have been unable or unwilling to finance and undertake for themselves the research needed to stay competitive in world markets. Given the diversity of the farm sector, the dissemination of research results and the application of improved management techniques are especially difficult. The extension services—DIGESA (Agricultural Extension Service) and DIGESEPE (Livestock Extension Service), with resource and personnel constraints, have been able to make only a very limited impact on improving productivity.

With respect to agricultural education, training and education programs can introduce new technology, change cropping patterns, improve the communication and dissemination of information, and generate greater efficiency in program and project implementation. However, these objectives are difficult to achieve when introducing subsistence farmers to non-traditional crops requiring higher levels of technology and the appropriate inputs and credit.

The Mission's objective is to "eliminate policy, institutional and infrastructural obstacles to realization of the [agricultural] sector's substantial untapped potential." To tap this potential, the Mission is developing initiatives vis-à-vis land, capital, labor, institutional strengthening, market participation, and food aid integration. With respect to institutional strengthening, the CDSS states that a principal focus of the policy dialogue is:

> to provide technical assistance to improve institutional capabilities. Technology transfer, credit delivery, research and extension, and training will all become better contributors to the sector as the result of plans by USAID and other donors to strengthen both public and private sector organizations working in agriculture.

HONDURAS

Development Assistance Program (DAP) FY 78 (5/78)

This DAP characterized the state of technology generation and transfer in Honduras as follows:

> Highly productive, low-cost technologies applicable to small farms and agrarian reform farms are virtually non-existent. Present delivery systems are qualitatively inadequate and reach only perhaps 10 and at most 20 percent of small farmers and agrarian reform farms. There is still considerable shortage of trained manpower particularly in specialized areas and the quality of training at the lower levels is wanting.

The DAP noted that the Government of Honduras (GOH) had recently decided to restructure and strengthen the national agricultural research system (PNIA). In connection with this decision, the GOH procured the services of the International Agricultural Development Service (IADS) to study and make recommendations concerning the totality of the research program. The study group's draft report proposed research priorities which:

> 1) focus primarily on small to medium farmers (both independent and agrarian reform); and 2) places continued emphasis on basic food grains with medium to long-run emphasis on vegetables, oil seed crops and livestock.... It then recommends a research strategy, i.e., farmer-oriented, interdisciplinary research; strengthening the national research station network; a strong manpower development program; and exploitation of opportunities to link with other research and development institutions engaged in activities complementary to those of PNIA.

The IADS report was being reviewed at the time this DAP was completed.

The DAP stated that the Mission's strategy is

> to help the Government to greatly expand the capacity of agriculture sector institutions to plan, program and manage their activities; to increase the numbers of adequately trained human resources for the sector at all levels; to extend significantly the coverage and improve the effectiveness of agriculture sector delivery systems including the creation of new systems; to provide agriculture sector delivery systems with more productive, low-cost technologies with emphasis on light capital technologies; and to create off-farm employment opportunities in rural areas.

Further, the Mission noted that it also would "advocate the use of non-governmental organizations." Also, the Mission indicated that an effort needed to be made

> to deal effectively with the vast numbers of small farmers who operate plots of from 1-35 hectares and who generally have received no services from the Government. To service this group, low-cost delivery systems must be devised. These systems would

involve the use of para-professionals/volunteers and demonstrations eventually covering large areas of the country.

Also, for the sub-group of the smallest-scale farms, the Mission would encourage the GOH to explore "the prospects for hillside agricultural techniques involving minimal terracing and some crop diversification, including tree crops."

With respect to agricultural education, the DAP stated:

As the resource flow to the sector increases and problems of the sector become more complex, the present urgent need for trained manpower at all levels will increase still more. Accordingly, AID programs will continue to finance considerable training abroad in specialized skills and to support training in national institutions. We will explore prospects for assisting in the further development of the national agricultural professional training capacity and be prepared to assist as necessary in increasing the effectiveness of campesino training.

With respect to agricultural research, the DAP stated:

AID will assist the Government to develop its agronomic research capacity and a research strategy compatible with production objectives and marketing prospects. . .

. And we will encourage the development of low-cost mechanical technologies in conjunction with the improvement of agronomic research and practices.

The following projects were identified for support during FY 78 and FY 79:

Agricultural Research (FY 78)—This will be a grant project to help the Government to...strengthen its agronomic research capacity and coordinate and develop a research strategy in support of production objectives compatible with marketing prospects. The project will be designed to... place priority on development of technological packages for new and expanding delivery systems for small farmers and agrarian reform farms.

Small Farmer Technologies Expansion (FY 79)—This grant activity will expand the present AID-financed appropriate technologies research and development activity to effect...usage of new on-farm, light capital technologies in selected areas throughout the country. The approach will be one of product development, pre-testing, testing and demonstration on a rather large scale closely related to agronomic research activities.

Agriculture Sector II (FY 79)—This sector program will concentrate on the central strategy problems of human resources development, government improvement with emphasis inter alia on decentralization, and delivery system expansion. One potential area for assistance would be improving the quality of instruction at the School of

Agriculture of the University of Honduras (CURLA) and the Catacamas Agricultural School.

Water Resources Management (FY 79)

FY 82 (1/80)

This CDSS stated that: "The main development problems facing Honduras are how to make the agriculture sector more productive and to get rural incomes up over the poverty line." USAID/Honduras' strategy for the agriculture sector is based on a Sector Assessment done in 1978. The CDSS noted that the "centerpiece" of the Mission's strategy was Agriculture Sector II which provided funds, among various activities, for human resource development (participant and in-service training) and strengthening of agricultural higher education. Further, complementary activities were supporting improvements in the GOH's agricultural research and extension efforts. The emphasis with respect to agricultural research was to refocus the Honduran research system toward farm-based, appropriate technology activities. The CDSS noted that in the 1982-86 period:

> A higher level of assistance probably will be needed for agricultural research and extension work. As new ecological zones open up and as results of research at international research centers become available, the need for expanded efforts in applied research and information dissemination will grow.

FY 83 (Update of FY 82 CDSS) (1/81)

This CDSS noted that for the FY 83-87 period, a "higher level of assistance [for institutional development] will be need for agricultural research and extension. As new ecological zones open up and as results of research at international research centers become available, the need for expanded efforts in applied research and information dissemination will grow."

FY 86 (5/84)

The Mission's agricultural strategy is identified in this CDSS as being that of helping "the commercially oriented farmers move progressively into higher value crops for domestic and export markets and processors. This should increase labor demand for the landless and create expanded market opportunities for traditional farmers who produce basic grain." Further, the CDSS notes:

> The Mission's experience indicates that these constraints [technology, marketing, and production assistance] are best addressed on a product-specific basis, and that efforts are most successful when a private producers' association plays the major role in providing assistance to producers. . . . During the CDSS period we plan to expand the product-specific, private sector led approach and apply it to export of non-traditional agricultural products. . . . The effort will be carried out through private producers' associations and a private agricultural research institute whose principal

focus will be on non-traditional commodities. AID assistance will be provided through the Export Development and Services Project...and an Agricultural Research Project....

...we will continue to help small farmers who produce mainly for the domestic market. Appropriate production technologies, improved farming practices, and land conservation techniques are now being introduced to small farmers through the Rural Technologies...and Natural Resources Management...Projects.... The research institute mentioned above will carry out some research on basic grains and an improved technology transfer system will be developed to further enhance the effectiveness of both of the above projects.

REGIONAL OFFICE FOR CENTRAL AMERICA AND PANAMÁ (ROCAP)

FY 82 (2/80)

ROCAP's strategy is to support regional institutional efforts to assist cooperating national institutions to improve their services to the target populations. In agriculture, the principal regional institutions receiving ROCAP support for projects involving agricultural research, extension, and/or education are the Tropical Agricultural Research and Training Center (CATIE) and the Inter-American Institute for Cooperation on Agriculture (IICA).

FY 84 (1/82)

This CDSS noted that the "central theme" of ROCAP's strategy over the CDSS period would be to support, at the regional level, a number of activities, including development of improved, appropriate technology for use by public and private national institutions; and development of human resources. In terms of the former,

> ROCAP's strategy has been, and continues to be, to address the existing technology constraints by assisting in the development and transfer to national entities of relevant technology. The on-going ROCAP projects in fuelwood, small farm production systems and coffee pest control are designed to achieve this objective. ...by working closely with national institutions and personnel on individual farms at the country level, these activities are strengthening the national capacity to conduct, adapt and extend field level research.

The CDSS also noted that formal and informal training, to strengthen the human resource base of the regional and national institutions, are integral activities in all of ROCAP's projects. But the CDSS stated that ROCAP sees a "need for a revitalized effort in training at all levels if the region is to mobilize its limited resources effectively and be capable of sustaining development efforts."

FY 85 (1/83)

This CDSS noted that the goals of the agricultural sector, established jointly by the Ministers of Agriculture of all five Central American countries in a February 1983 meeting, and with which ROCAP concurred, are: (1) to expand exports from the region of non-traditional agricultural commodities and processed agricultural goods; and (2) to promote regional self-sufficiency in basic food crops.

FY 86 (4/84)

This CDSS indicated that ROCAP would propose grant assistance for research on non-traditional crops and transfer of technologies to the national level through both public and private sector efforts. ROCAP would continue to use regional institutions, particularly CATIE, to address research and technical assistance requirements. The Mission planned to continue work with CATIE on small farming systems to increase non-traditional exports and the production of domestic food crops. Key projects in support of this strategy would be Small Farmer Production Systems and Export Crop Diversification. A limited role was seen for PVOs working in conjunction with national counterparts in the dissemination of information and technologies developed by the regional projects.

FY 89 (12/87)

With respect to the objective of increasing agricultural production, this CDSS stated that ROCAP's strategy is

> to support national public and private institutions and USAID Missions in CA/P in the generation, transfer and use of information needed for improved agricultural production and for the management of the natural resources to sustain that production.

In support of this strategy, ROCAP proposed a number of steps, including training Central Americans by improving the capability of CA/P institutions to provide professional level degree and technical training related to agricultural production, adapting technologies by supporting experiments in techniques for improved agricultural production, and transferring technologies by supporting the transfer of existing information and that generated by research to the potential users in the public and private institutions and producer groups in the countries of the region.

In the area of training, project activities were to focus on providing scholarships for graduate level (M.S.) study at CATIE in integrated pest management of food crops; tree crop production for wood and forage; on-farm soil and water conservation/irrigation; and mid-level study leading to a forestry degree. In addition, training will involve curriculum design and funding support for short-term professional and mid-level non-degree training for researchers, educators, technicians and extensionists in: integrated pest management and post-harvest handling and storage for food crops; tree crop production; on-farm soil and water conservation; and support for a regional training capacity in post-harvest handling and storage of food crops. Also, the Mission proposed seeking means to establish perpetual

scholarship endowments in these and other areas, with the scholarships being supported by private and public donors.

In the area of technology adaptation, the Mission proposed creating and implementing technology (research) networks in food crops through IICA, CATIE, and the International Agricultural Research Centers (IARCs); extending knowledge of food processing; validating integrated pest management technologies for food crops through CATIE, the Honduran Agricultural Research Foundation (FHIA), the Pan American Agricultural School (EAP), and other collaborating institutions; and validating irrigation technologies for food crops and tree crop production technologies. Also, the proposed program would include support for expansion of genetic resource collections of economically important food crops, and for carrying out research in integrated pest management, tree crop production, on-farm soil and water conservation, and selected disciplines related to food crop production.

The Mission also proposed that a major thrust would be

> to accelerate the pace, broaden the channels, and improve the quality of technology transfer. This will include efforts to identify the most effective technology transfer methods, support the development and consolidation of extension materials, and help countries design programs for massive dissemination of technologies in integrated pest management, tree crop production, on-farm soil and water conservation, food crop production, and post-harvest handling and storage. This thrust will also seek means to share reference information needed for the implementation of the above technologies through the creation and operation of regionally accessible documentation centers, libraries and data bases; and through establishing and operating regional PVO coordination mechanisms to improve the channeling of bilateral funding to national PVO and other groups to disseminate these technologies.

ANNEX B
A REVIEW OF THE AGRICULTURAL RESEARCH, EXTENSION, AND EDUCATION COMPONENTS OF USAID MISSION AGRICULTURE AND RURAL DEVELOPMENT PORTFOLIOS IN THE LAC REGION

This annex contains a list of AID-funded projects in the LAC region that contain agricultural research, extension, and/or education components. To develop this list, LACTECH requested AID's Center for Development Information and Evaluation (CDIE) to list all AID-funded projects in the LAC region in the 1980s that could be identified, through a key word search, as containing research, extension, and/or education components.

The projects are listed regionally: Andean, Caribbean, and Central American. Within each region, the projects are listed alphabetically by country. In each country, projects generally are listed chronologically, with project number (last four digits) and project title. For each project, CDIE provided a printout that provided information on the project's logical framework. Based on the information provided on the project in the printout, each project was assigned a set of codes to identify which projects contained research, extension, and/or education components. The coding scheme used follows:

	ACTIVITY		
LOCUS	Research	Extension	Education
Public Sector	R1	X1	E1
Private Sector	R2	X2	E2

This provides a summary overview of the activities (agricultural research, extension, and/or education) included in each project and the locus of implementation responsibility (public vs. private) for each activity. The project activities that provided the basis for the classification are then listed on the following pages, providing the reader with a more detailed background on the research, extension, and/or education components of each project.

ANDEAN REGION

BOLIVIA (511-xxxx)

R	X	E	FY-FY	xxxx	Project Title
1	1	1	83-90	0543	Chapare Regional Development
1	1	1	85-93	0586	Agricultural Marketing/Productivity
		2	86-90	0589	Private Agricultural Producer Organizations

ECUADOR (518-xxxx)

R	X	E	FY-FY	xxxx	Project Title
	1	1	80-87	0012	Integrated Rural Development
1		1	80-90	0032	Rural Technology Transfer System
1	1	1	82-90	0023	Forestry Sector Development
	2		84-89	0019	Non-Traditional Agricultural Exports
		2	85-91	0062	Agricultural Education - OPG
2	2	2	88-93	0068	Agr. Research, Extension & Education
R	X	E	89-92	0069	Natural Resources Management

PERU (527-xxxx)

R	X	E	FY-FY	xxxx	Project Title
1	1	1	80-89	0192	Agr. Research, Extension & Education
1	1	1	81-91	0244	Upper Huallaga Agricultural Development
1	1	1	87-89	0282	Agricultural Technology Transformation
1	1	1	82-88	0240	Central Selva Resource Management
1	1		88-90	0321	Central Selva Resource Management II

CARIBBEAN REGION

DOMINICAN REPUBLIC (517-xxxx)

R	X	E	FY-FY	xxxx	Project Title
1	1	1	81-88	0126	Natural Resources Management (subproject 2)
2	2	2	82-85	0162	Inland Fisheries II
1	1	1	83-90	0159	On-Farm Water Management
		1	83-91	0160	Agricultural Sector Training
shelved		87-89		0180	Agricultural Research and Extension (?)
2	2	2	87-92	0214	Commercial Farming Systems
2		2	89-91	0243	Agribusiness Training

HAITI (521-xxxx)

R	X	E	FY-FY	xxxx	Project Title
1			78-88	0092	Agricultural Development Support II
2	2		81-89	0122	Agroforestry Outreach
2			83-88	0169	NGO Support I
1/2		86-91		0191	Targeted Watershed Management
2	2		90-95	0217	Agroforestry Program (follow-on to -0122)

JAMAICA (532-xxxx)

R	X	E	FY-FY	xxxx	Project Title
		1	84-90	0082	Agricultural Education
2			86-93	0128	Jamaica Agricultural Research
1			85-89	0113	Hillside Assessment
1	1		87-94	0101	Hillside Agriculture

RDO/C (538-xxxx)

R	X	E	FY-FY	xxxx	Project Title
	1	1	82-89	0068	Agricultural Extension II
1	1	1	83-89	0099	Farming Systems R&D
1	1		84-87	0101	St. Vincent Agricultural Development
1	1	1	86-87	0007	Food Crop Production (CARDI)
1	1	1	89-94	0164	Agricultural Research and Extension

CENTRAL AMERICAN REGION

BELIZE (505-xxxx)

R	X	E	FY-FY	xxxx	Project Title
1	1	1	83-92	0006	Livestock Development
		2	84-88	0010	Special Development Activities Fund
2			85-90	0008	Commercialization of Alternative Crops
2	2	2	87-92	0016	Toledo Agricultural Marketing

COSTA RICA (515-xxxx)

R	X	E	FY-FY	xxxx	Project Title
2	2	2	87-92	0237	NTAE Technical Support
1 & 2			88-93	0235	Northern Zone Consolidation
			90-	0243	Forest Resources for a Stable Environment

EL SALVADOR (519-xxxx)

R	X	E	FY-FY	xxxx	Project Title
1	1	1	83-88	0265	Agrarian Reform Sector Support
1/2	1	85-91		0303	Water Management
	2		87-94	0327	Agribusiness Development
	2		88-91	0364	Community Based Rural Development (OPG)
			89-92		Sustainable Agriculture (LC-
			90-94	0382	Technoserve Rural Enterprise Development
	2		91-94	0362	Coffee Technology Enhancement
	2		91-94	0351	Commercial Farming
	2		91-96	0374	Sustainable Agricultural Production

GUATEMALA (520-xxxx)

R	X	E	FY-FY	xxxx	Project Title
1	1	1	81-89	0255	Small Farm Diversification Systems
1	1	1	83-93	0274	Highlands Agricultural Development
		2	86-89	0351	Aquaculture Extension
2	2		86-89	0355	Guatemala Dairy Development
	2		88-93	0384	Development Training and Support

HONDURAS (522-xxxx)

R	X	E	FY-FY	xxxx	Project Title
1	1	1	79-89	0157	Rural Technologies
		2	80-83	0170	Rural Pilot Schools Development
	1/2	80-89		0168	Natural Resources Management
		2	81-84	0189	S.O.S. Training of Migrant Youth
		2	82-84	0223	Agricultural Education
			84-89	0207	Export Promotion and Services
2	2		84-94	0249	Agricultural Research Foundation
2	2	2	89-89	0362	Pan American Agricultural School
	1	1	89-93	0292	Land Use Productivity Enhancement

ROCAP (596-xxxx)

R	X	E	FY-FY	xxxx	Project Title
1	1	1	81-90	0089	Fuelwood and Alternative Energy Sources
1	1	1	81-90	0090	Regional Coffee Pest Control
1	1	1	84-89	0110	Integrated Pest Management
1	1	1	85-91	0117	Tree Crop Production
		2	85-91	0129	Regional Agricultural Higher Education
1	1	1	87-90	0127	Regional Agricultural Technology Networks

ANDEAN REGION

BOLIVIA

The Chapare Regional Development (CRD) (511-0543) project, being implemented by IBTA (Bolivian Institute of Agricultural Technology) and private sector organizations, was designed to run from 1983 to 1990. CRD aims to provide alternative income opportunities for coca growers by upgrading small farm agricultural and forestry production in Bolivia's Chapare region of Bolivia. A Secretariat for the Development of the Bolivian Tropics (SDBT) was to be established in the Ministry of Coordination and Planning, under guidance of an interministerial committee, to coordinate project activities in consultation with the Chapare District Consultative Council. The project design provided for the following research, extension, and education components:

Research: Coordination by IBTA of research on agricultural and forestry technology packages for Chapare's nine micro-environments;

Extension: Creation of demonstration farms in each micro-environment, with promotion of technology packages via field days and radio, with feedback provided via farmer community councils. Community nurseries staffed by IBTA, with technical assistance from the National Forestry Department.

Education: Funding of M.S. training of 10 IBTA staff and short-term training for SDBT staff.

The 9/86 project evaluation found that lack of coca control had made it impossible to implement some project components and that project objectives had not been clearly conceptualized and

> translated into an aggressive course of action...cropping systems improvements have been neglected, even though Chapare farmers typically practice multiple cropping; more attention to annual perennial intercropping is needed.....Livestock activities should be eliminated; the region is not suited to cattle production, nor have farmers shown interest. Chipiriri research station is located in an area ill-suited for agricultural production and atypical of most of Chapare; research on citrus and field crops should be transferred. Recruitment and training of promoters has proceeded well but deserves even greater attention since there is no assurance that research and extension will continue after project completion....

The evaluation proposed that starting development assistance efforts in poverty-stricken areas outside the Chapare, such as the high valley regions of Cochabamba, could reduce the incentive for residents of such areas to migrate to the Chapare.

The 11/87 project amendment extended the project into the high valley regions of Cochabamba. Under this amendment, project assistance was to be provided for reforestation; soil and water management structures; flood control; improvements in potato seed, cereal, and vegetable production; and pest control, with transportation, marketing, and infrastructure inputs to come later. Further, the amendment provided that, in the Chapare, infrastructural and agricultural credit assistance were to be limited to communities and farmers who have eradicated 70% of their coca-growing area.

A subsequent amendment (3/89) added two new conditions. First, credit would be available only to farmers who have eradicated 10% of their coca plantings and agreed in writing to a time-phased total and final eradication. (IBTA would have the responsibility of developing individual farm investment plans to determine credit needs. Other assistance such as farm inputs, training, and technical assistance, and access to agro-processing investments would be provided unconditionally.) Second, the amendment provided that communities would receive 1, 2, and 3 social infrastructure facilities/projects after eradicating, respectively, 30%, 70%, and begun eradicating the final 30% of their coca plantings.

In the Chapare region, USAID/Bolivia is fully funding IBTA's implementation of the Chapare project. In the Associated High Valleys component, project funding is supporting a mix of public (IBTA) and private (PVO) participants. No project component is aimed at institution building per se but rather at strengthening the capability of the participating organizations to carry out their responsibility to implement a project for which the primary motivating factor on the part of the donor country (i.e., the U.S.) is not to strengthen Bolivia's technology generation and transfer capacity per se but rather the desire to address

the supply side of the U.S. drug problem by trying to encourage Bolivian coca growers to produce crops other than coca.

In this context, a training needs assessment (Byrnes, 1990b) for the project identified the need to strengthen the capacity of the implementing agencies to carry out on-farm adaptive research in the project's two regions (Chapare and the Associated High Valleys). As of mid-1990, a Scope of Work was being developed for the evaluation of the Chapare Regional Development Project.

The Private Agricultural Producer Organizations (PAO) (511-0589) project, programmed for 1986-1990, is being implemented by a technical assistance team, with support from private Bolivian firms, under general oversight by the Ministry of Planning and Coordination. PAO aims to reactivate the private agricultural sector in Bolivia after state controls on production and prices were removed, by strengthening and expanding the capacity of PAOs to provide members with private-sector services (e.g., inputs such as seed and agricultural machinery, credit, technical assistance, storage, transport, and marketing). The project seeks to develop such services by providing technical assistance, equipment, training, and financial loans.

While not designed as an agricultural research, extension, and/or education project per se, the project does include short-term training for PAO leaders, members, and administrative and technical personnel. The training includes technical on-farm demonstrations, classroom workshops and seminars, and field visits to Bolivian, neighboring country, or U.S. sites. The project also included environmental education for PAO members.

The 4/90 evaluation found only one PAO, the oil and wheat producers association (ANAPO), where a production check-off collected by processor firms or marketing agencies had been a viable financing scheme for supporting agricultural research and extension. In the check-off scheme, farmers sell their produce to a processor or marketer who deducts a small fee for services from the producer's payment. ANAPO collects 1% of the value of all produce marketed from processors and exporters, with the funds being shared among ANAPO (70%), the regional agricultural chamber (15%), and the Tropical Agricultural Research Center (CIAT/Bolivia) (15%). At present, only ANAPO has implemented a system like this. Further, the technical assistance provided by ANAPO is tied to the association's credit program. A farmer's loan is paid out in stages during the production cycle and only on the recommendation of ANAPO's field technicians. The association has five full-time agronomists to carry out this work; also the ANAPO hires another 15 newly qualified agronomists from the university to assist in this work during the harvest.

Besides crop oversight, the field agronomists help farmers with production problems as these arise. Where an agronomist is not familiar with a problem, he will call upon a CIAT/Bolivia specialist to accompany him to study the problem. Also, in collaboration with CIAT, ANAPO sponsors annually about ten varietal trials on farmers fields and holds at least two field days for producers.

The PAO project evaluation emphasized the importance of technology transfer to PAOs, noting that technology transfer is a major concern of all producer associations and recommending that technology transfer be given priority in project activities.

> Improving yields and production, especially for export, will require effective agricultural extension for producers. Producer associations can provide such assistance for particular commodities as services to their members. These services, which can be financed from marketing feeds, would add greatly to member confidence in their associations. The need now is to try different designs for the private-sector delivery of agricultural extension (Appleby and Eason, 1990: iii).

On the other hand, the evaluation cautioned that agricultural commodities with a very generalized production and distribution pattern may not be amenable to the check-off system:

> the necessity is that the commodity undergo some processing before it is brought to market. Whenever such a marketing bottleneck occurs or can be created, the processing firm will be able to levy the small service fee for participating associations or organizations (Appleby and Eason, 1990:18).

The Agricultural Marketing/Productivity (511-0586) project, originally programmed for 1985-93, did not have a PID (Project Identification Document) until 1/89. The project's objective, as conceived in the PID, is to improve agricultural productivity/marketing, especially export marketing, strengthen the GOB's policy analysis capacity, and provide agricultural training at technical through M.S. levels. The project includes the following research, extension, and education components:

> Research: Under the marketing/productivity component, development of a market information system and improved postharvest facilities and technologies. Under the policy component, establishment of a small policy analysis unit in the Ministry of Rural Affairs and Agriculture (MACA) to develop and assess agricultural policies, especially in regard to the private sector, the delivery of agricultural services (e.g., credit), and economic incentives for production increases and marketing improvements.
>
> Extension: Provision of technical assistance in marketing to farmer organizations.
>
> Education: Training of agricultural technicians at two secondary schools, establishment of a scholarship program for practical training at the Pan American Agricultural School (in Honduras), and provision of short-term and U.S. Masters-level training.

Analysis

The USAID/Bolivia portfolio during the 1980s placed little to no emphasis on institution building for the strengthening of agricultural research, extension, and education. The portfolio was influenced by two overriding objectives: (1) to find alternative crops and

technologies to substitute for the production of coca; and (2) to reactivate the private agricultural sector by strengthening and expanding the capacity of PAOs to provide members with private-sector services (e.g., inputs such as seed and agricultural machinery, credit, technical assistance, storage, transport, and marketing).

In terms of the former objective, a recent training needs assessment of the Chapare project identified a need to strengthen the capability of both public and private sector organizations to carry out adaptive on-farm research as essential for successfully generating and transferring crops and technologies that can serve as income alternatives to the production of coca. Thus, in both of the project's target sub-regions (Chapare and Associated High Valleys), technology generation and transfer is being counted on as a key element in the Mission's program to substitute alternate crops and technologies for the production of coca. Yet, during the 1980s, none of the USAID/Bolivia projects, except the Chapare project, has placed any emphasis on strengthening the capacity of public or private organizations to conduct agricultural research and extension. In terms of the latter objective, while the PAO project has had some success in strengthening the capability of producer associations to provide various services to members, the project's emphasis on "private-sector services" neglects that the farmer's demand for such services depends, to a large extent, on the farmer's demand for and the available supply of agricultural technology. Yet none of the PAO project's inputs are directed at improving the ability of private or public organizations to generate and supply technologies that farmers will demand. Only one PAO was found to be providing, through a check-off system, funding for agricultural research; and this PAO is reaching only a relatively elite group of farmers in the Santa Cruz region.

Thus, while the success of the projects in the USAID/Bolivia portfolio ultimately depends on or at least will be influenced by the capability of Bolivian organizations to generate and transfer productivity- and income-increasing technologies, the portfolio lacks any systematic long-term program to strengthen the research and extension capability of the public and private organizations on which the Mission is relying for project implementation. At the same time, a recently conducted International Service for National Agricultural Research study (ISNAR, 1989) identified the need to rebuild and strengthen Bolivia's agricultural research and technology transfer system.

IBTA, as the ISNAR study reported, must confront a series of difficult conditions such as the size of Bolivia, the country's diverse agroecological situations, the varying social conditions and production abilities of farmers, and the relatively low priority that Bolivia traditionally has assigned to agricultural development. Further, the study found that IBTA's resources have deteriorated because of the loss of qualified staff, degradation of priority-setting and programming systems, and the incapability of extension services to attend efficiently to the needs of the rural population and, in particular, farmers.

The study proposed restructuring IBTA by creating: (1) a "central normative unit;" "regional services for research and transfer of agricultural technology;" "national programs for research and transfer of agricultural technology;" and departmental "technological linkage units" (to coordinate with other organizations involved with technology transfer in the public and private sectors). While the regional services initially would be funded by the GOB and

departments, there would be a strategy for gradual development and consolidation of the system, whereby the regional services would progressively receive increasing local support from development corporations, regional agricultural chambers, etc. Once local support provided the majority of the funding for the regional services, these services would become autonomous entities, adopting a status similar to that actually held by CIAT/Bolivia in the department of Santa Cruz.

The study recommended a phased action plan of steps to implement the proposed system. Further, the study identified the role that donors could play in supporting a global project to provide all of the components needed for an institutional strengthening program. This program could be structured in terms of the following international cooperation projects:

- Project for strengthening the central unit of a national agricultural research and technology transfer system.

- Project for strengthening and consolidating national agricultural research and technology transfer programs.

- Project for the establishment and consolidation of the technological linkage units.

- Project for supporting the regional services of the agricultural research and technology transfer system.

While the study's proposed action plan for implementing the agricultural research and technology transfer system recognizes the need for training the personnel required to operate the system, neither the study nor the action plan identified the problems or needs of Bolivia's agricultural education system.

ECUADOR

USAID/Ecuador, during the early 1980s, provided project support for strengthening public sector capability to carry out agricultural technology generation and transfer. From 1980 to 1987, the Integrated Rural Development (IRD) (518-0012) project specifically focused on technology transfer. IRD was designed to be implemented by the Government of Ecuador (GOE) Secretariat for Integrated Rural Development (SEDRI), with SEDRI's primary role being to coordinate the project's various implementing agencies. IRD was to provide support for extension services and a training unit to train project technicians to train local contact agents and campesinos. But the 4/86 Audit Report reported that SEDRI was ineffective in planning, coordinating, monitoring, and evaluating project activities. As a result of various implementation problems (e.g., frequent personnel turnover), SEDRI failed to meet specified schedules in executing agreements with several of the agencies implementing the project, and to satisfy certain conditions precedent. While over 15 other donor-financed IRD projects were designed during IRD's life, the project was not able to institutionalize IRD to the degree planned and SEDRI was dismantled in 1986.

From 1980 to 1990, USAID/Ecuador also supported a multi-component Rural Technology Transfer System (RTTS) (518-0032) project. RTTS was initially implemented by SEDRI, then by the National Science and Technology Council (CONACYT), and then by the Ministry of Agriculture (MOA). RTTS's subproject 1 was to establish a rural technology transfer system for strengthening and coordinating the country's research, extension, and education institutions. The system was to provide a staff of three project specialists (in research, extension, and education) to assist the implementing agencies in developing, implementing, and evaluating project activities. Subproject 2 was to help the GOE develop and disseminate technologies appropriate to small farmer needs (e.g., develop soil and water conservation management systems for small farmers and conduct adaptive research on selected crops). Also, this component was to improve links among research, extension, and education institutions (e.g., to restructure the Catholic University of Guayaquil's curriculum). But when problems were encountered trying to implement projects (i.e., IRD and RTTS) through SEDRI, implementation responsibility was transferred to CONACYT.

A 7/84 evaluation of the project concluded that, while the project's basic objective continued to be sound, the project's design "was overly ambitious, unrealistic, and at times almost self-destructive." Also, the evaluation found that project

> administration and financing have been most ineffective. CONACYT...was established after project approval and did not participate in the project's design; as its operations got underway, CONACYT found the requirements for [technical assistance (TA)] and training too stringent and inflexible, and felt that it did not have the necessary flexibility to adapt [sub-projects] to...priority needs.... As a result, CONACYT has virtually ceased to approve any...TA or training for the past year and a half, and has prevented the [TA contractor] from performing its function. In addition, the project plan to establish informal collaborative [links] among rural institutions required an implementing agency with strong administrative, planning, and technical capacity; it was unrealistic to expect CONACYT, a new institution, to have these capacities, or the [GOE] to be able to provide sufficient counterpart funds.

Further, while the evaluation found TA in the sub-projects to be effective at the technician level, TA was less effective at the level of top management and administration. The lack of management training at CONACYT limited the quality of training in the sub-projects. Finally, at the time of the evaluation, funds for private sector research had not yet been used.

The evaluation recommended a major redesign that included a focus on technical training (in-country and U.S. short-term and degree training). Further, the evaluation recommended selecting a new lead institution, specifying a limited number of institutions for investment, and identifying research priorities to be addressed by the redesigned project. Subsequently, the 10/85 project amendment revised the RTTS project strategy to emphasize (1) training of researchers, technicians, and farmers; (2) use of private producer associations to implement commodity-specific project activities; and (3) shifting of project implementation responsibility from CONACYT to the MOA. The emphasis on training was further supported, during 1985-1991, by the Mission's Agricultural Education (519-0062) project which provided an Operations Program Grant (OPG) to the Wilson Popenoe Foundation to

support its program of scholarships for Ecuadorean undergraduate students to Honduras' Pan American Agricultural School (EAP).

Even as USAID/Ecuador struggled in the 1980s to strengthen the capability of public sector agencies to carry out technology generation and transfer on food commodities produced by small- to medium-sized farmers, the Mission began in the mid-1980s to focus on non-traditional agricultural exports. Between 1984 and 1989, the Federation of Ecuadorean Exporters (FEDEXPOR) and the Ecuador National Association of Businessmen (ANDE) implemented the Non-Traditional Agricultural Exports (NTAE) (518-0019) project. NTAE was designed to provide financing of preinvestment studies and technical assistance to small-to-medium firms seeking to develop new products and markets.

Subsequently, the 5/88 project evaluation concluded that the NTAE project design was

> incomplete and faulty; measures of achievement were overestimated and inappropriate and the timeframe was insufficient; the budget was too small; the time required to develop and change the attitudes of participants or potential participants was not taken into consideration; [Mission] management was inadequate; there was not continuity of TA; the investment credit facility did not perform as expected and there were too many delays; and the agreement between [the Mission] and the Central Bank was confusing and caused delays in implementation.

A Phase II was recommended that "should be developmental and...build on the basic institutional structure...now in place. It should stress TA and the development of a production and marketing base from which to launch a full-scale export marketing program. A systems approach is recommended." Support for NTAE continues under a 7/20/89 Cooperative Agreement with ANDE.

By the late 1980s, the Mission's emphasis on working through the private sector, an emphasis already evidenced in RTTS's work with private producer associations and NTAE's work with FEDEXPOR and ANDE, was given further impetus by the Agricultural Research, Extension & Education (AREE) (518-0068) project (1988-93). This project seeks to improve the public-private system of agricultural research, extension, and education (REE) for selected commodities. AREE is being implemented by the private Foundation for Agricultural Development (FUNDAGRO), established with USAID assistance. An endowment, initially capitalized with the equivalent of $3.3 million in P.L.480-generated local currency, was established to provide independence and flexibility for FUNDAGRO. AREE is to strengthen FUNDAGRO institutionally, support its role in creating a REE system for three priority commodity programs (PCPs), and support related special programs. Under the project, FUNDAGRO was to hire professional, technical, and support staff, and to create a coastal programs office. It was expected that FUNDAGRO would seek additional resources from local donations and bilateral donors and would develop over time income from managing programs and projects financed by donors and the private sector.

As AREE's central activity, FUNDAGRO was to bring together public and private REE institutions, including INIAP (National Institute for Agricultural Research), the Inter-American Development Bank's PROTECA project, producer co-ops and agricultural faculties in PCPs for coffee, yucca, and milk. Activities in each PCP were to include providing complementary research resources to INIAP, forming research-extension linkage units (RELUs), representing producers and public REE institutions, supporting public and private sector extension services, forming links with educational institutions, and funding M.S. and Ph.D. candidates.

The RELUs were to be responsible for identifying farmers' needs, testing technologies on farmers' lands, and training extensionists to transfer technologies. Also, RELUs were to provide guidance to agricultural training institutions, especially regarding curricula for extensionists. Participation of private firms and farmer associations in the PCPs was to be actively sought, along with linkages with international research centers and U.S. and third-country universities and agricultural institutions. This component also was to be linked to Peace Corps activities and to AID/Washington-funded nutrition programs.

The project design also included a component to support programs to transfer technologies, successfully used elsewhere, to Ecuador to fill specific niches in domestic and export markets. FUNDAGRO's role was to link a potential market with producers who are willing to underwrite some trials. Also, FUNDAGRO was to conduct an inventory of existing resources to support the market linkage program, and to sponsor state-of-the-art seminars on innovative technologies.

In the natural resources area, USAID/Ecuador initiated, in 1982, a Forestry Sector Development (FSD) (518-0023) project that is scheduled to run through 1990. Implemented by GOE's National Forestry Program (PNF), with participation by public and private institutions responsible for conducting and partially funding project activities, 70% of project funding is directed to forest research and extension (field demonstrations). Commercial scale demonstrations of plantation forestry, natural regeneration, and agroforestry are to be conducted (10,000 ha in the high Sierra, humid tropical lowlands, and arid coast). Species trials in each region were to be conducted each year. Extension was to include technical assistance and in-service "learning-by-doing." Training for PNF staff (central and district, technical and professional) was to strengthen PNF's ability to identify and plan projects, conduct macro-level planning, coordinate research and demonstrations, disseminate research findings and other information, and offer outreach and assistance at its district offices. The 12/85 project amendment increased the project's emphasis on agroforestry, including demonstration projects in Napo Province, where some 25 communities or co-ops were to be provided technical assistance and other inputs. Project assistance also provided for selected highland and coastal areas.

For 1989-92, the Mission is implementing a Natural Resources Management (NRM) (518-0069) project that is aimed at fostering technologies and policies that contribute to the sustainable use of Ecuador's renewable natural resources. NRM contains a mix of research, extension, and education components, as follows:

Research: Activities are to focus on problems identified in field demonstrations, and evaluate the results of the demonstrations. Policy studies and discussions are to clearly define the existing relationships between the use of natural resources and overall government policies for agriculture, tourism, colonization, and other relevant topics.

Extension: Field demonstrations of appropriate technologies are to be designed and implemented in selected ecological zones and social settings for the sustained, economically productive use of natural resources. Examples of potential demonstrations are: irrigation on steep slopes combined with soil conservation techniques, crop diversification, and wind breaks; production of wood and seafood from mangrove forests; combined tree-livestock-agricultural crop systems; and animal production in the high Andean grasslands.

Education: Public education is to lay a base for wider appreciation and support of the sustainable use of natural resources. The results of the field demonstrations, policy, and research components are to provide material for this educational activity. (CP 1989, Annex II, p. 321)

Analysis

During the early 1980s, USAID/Ecuador's efforts to strengthen agricultural research, extension, and education focused on assisting public sector agencies. IRD provided assistance to strengthen SEDRI's capability to coordinate extension by various implementing agencies. But, by 1986, integrated rural development had not been institutionalized and SEDRI was dismantled. During this same period, USAID/Ecuador's RTTS project sought to assist public agencies, initially SEDRI, and subsequently CONACYT and the MOA, respectively, in strengthening technology transfer. But RTTS's approach to technology transfer was more systematic in that project assistance was aimed at strengthening the capability of public sector agencies to assist the implementing agencies in developing, implementing, and evaluating project activities, and in improving links among research, extension, and education institutions.

However, USAID/Ecuador's efforts to develop the capability of public sector agencies to coordinate agricultural technology generation and transfer were repeatedly frustrated during the early 1980s. Thus, a mid-1984 evaluation recommended a major redesign that marked a shift away from these projects' initial emphasis on extension and toward an emphasis on providing technical (in-country and U.S. short-term and degree) training. While the 10/85 project amendment revised RTTS' strategy to emphasize training of researchers, technicians, and farmers, the lead institution continued to be a public agency (MOA). But the amendment provided for increased participation by private producer associations in implementing commodity-specific project activities. The emphasis on training was reinforced by the Mission's support of the Agricultural Education project that funded scholarships for Ecuadoreans to study at the EAP in Honduras.

But even as the Mission continued in the mid-1980s to struggle with the task of strengthening public sector capability to carry out technology generation and transfer on food commodities, the Mission began, under the Non-Traditional Agricultural Export project to focus on NTAE crops; also, this project's strategy of providing technical assistance to private groups such as FEDEXPOR and ANDE accelerated an increasing emphasis by the Mission on providing development assistance through private organizations. Yet a mid-1988 evaluation of the NTAE project basically concluded that more time and resources would be needed to develop private sector ability to achieve the objectives of the project. The evaluation recommended a Phase II which "should be developmental and should build on the basic institutional structure that is now in place. It should stress TA and the development of a production and marketing base from which to launch a full-scale export marketing program. A systems approach is recommended."

In effect, turning to the private sector had not provided a "magic bullet" for solving the institutional development problems previously encountered in trying to work through public agencies. Yet, the launching of the Agricultural Research, Extension, and Education (AREE) project in 1988 provided further evidence of USAID/Ecuador's continuing and growing emphasis on working with and through the private sector. While AREE seeks to improve the public-private system of agricultural research, extension, and education (REE) for selected commodities, the project is being implemented by a private Foundation for Agricultural Development (FUNDAGRO), established and largely funded by USAID.

Even as USAID has provided significant funding for FUNDAGRO, a series of Agricultural Sector Assessment seminars, sponsored by USAID/Ecuador as part of the Mission's Policy Dialogue with the GOE, have stressed a need for increased public support for agricultural research and the science base. Indeed, the recently completed USAID/Ecuador Agricultural Sector Assessment identified the country's inadequate science base as one of the two major constraints to greater progress in agriculture, the other being discriminatory macroeconomic policies. The Minister of Agriculture, as a result of these seminars, has requested technical assistance to help implement a plan to create an autonomous National Research Service (INIAP). A former USAID staff person, under FUNDAGRO sponsorship, accepted responsibility to draft the needed legislation and to work closely with the Congress and the Administration to create an administratively autonomous and adequately funded INIAP.

PERÚ

While USAID/Ecuador's Agricultural Research, Extension, and Education project did not start until near the end of the 1980s, USAID/Perú's Agricultural Research, Extension, and Education (AREE) (527-0192) project began at the decade's outset (1980) and ran through 1989. AREE was implemented by a project-supported National Research, Extension, and Education (REE) Management Division of the newly-created public sector National Agrarian Research and Promotion Institute (INIPA), Ministry of Agriculture and Food (MAF). The REE Management Division, composed of key agricultural institutions and universities, was to plan, coordinate, and implement REE activities aimed at strengthening the capability of Perú's agricultural technology generation and transfer system to deliver

productivity-increasing technologies (for priority crops) to small farmers in the Sierra. The following REE activities were supported by AREE project:

> Research: Five regional research centers (RRCs) were to be formed to conduct applied research on soil, water, pest, and disease conditions, while five national production programs (NPPs) were to be formed to develop improved production packages for delivery to 100,000 farmers by extensionists. A research support unit was to be created to provide technical assistance to the NPPs, disseminate research results, and conduct advanced research.
>
> Extension: Five existing research sites were to be used to demonstrate technology packages and to produce improved seed and genetic stock. Extensionists were to provide farmer feedback for updating technology packages. Six regional service laboratories (RSLs) were to be formed to supply soil, water, and plant/animal tissue analysis to farmers.
>
> Education: NPP personnel were to receive short-term training in extension/research and 500 extensionists were to be trained. One researcher and one extensionist from each NPP were to receive post-graduate training (e.g., in soil fertility and genetics). For each RSL, six individuals were to receive short-term training in analysis interpretation, equipment operation, and other areas. For each RRC, non-degree training for updating research capability and two-year M.S. training were to be provided, respectively, to two researchers, while five researchers were to receive foreign training at the M.S./Ph.D. levels. In-country training was to be given at the National Agrarian University (NAU) at La Molina, five of whose graduate faculty were to receive overseas Ph.D. training. NAU was to provide specialized short-term training for 20 researchers from regional agricultural universities.

The 3/84 project evaluation concluded that the project's technical assistance had been diverted "to help [a] newly-created INIPA combine AID, BID, and IBRD projects into a nationwide Integral REE Program (IREEP)." In support of IREEP, the project organized 18 Centers for Agricultural Research and Extension (CIPAs), five Regional Research Centers (RRCs), and five National Production Programs (NPPs), the latter having made "especially good progress in developing improved corn, rice, and potato technologies and extending them to farmers." At the time of the evaluation, the project was in the process of developing five regional and three central service laboratories (RSLs) for crop extension/research and three systems-focused National Programs, while links with International Agricultural Research Centers (IARCs) and the Collaborative Research Support Projects (CRSPs) had been established.

The evaluation concluded that several unplanned effects (some due to the creation of INIPA and IREEP) and weaknesses hampered or altered the project, including: adoption of the ineffective training and visit extension system; integration of the NPPs, RRCs, and RSLs within the CIPAs; reduced emphasis on education and on the role of the National Agrarian University (UNA); failure to implement the planned national research and management units

(the latter adding to INIPA's management difficulties); 1983 floods and drought; and inadequate Government of Perú (GOP) support.

The 9/85 project amendment provided funding support for: (1) the five NPPs; (2) integrated research/extension programs of INIPA in the Sierra and Selva regions; (3) programs in agroeconomics, laboratory services, and foundation seed to support INIPA extension; (4) national programs in integrated pest management and genetic resources to support INIPA research; (5) an expanded INIPA human resources/education program; and (6) new INIPA offices in quantitative methods and international cooperation and assistance to improve INIPA's management of physical and financial resources. A 1/87 Grant provided funding to the International Potato Center (CIP) to provide technical/administrative leadership to INIPA.

Between 1987 and 1989, USAID/Perú provided funding support for the Agricultural Technology Transformation (ATT) (527-0282) project. Responsibility for project implementation was assigned to the National Institute for Agricultural and Agro-Industrial Research (INIAA), formerly called the National Agrarian Research and Promotion Institute (INIPA). ATT was designed to develop and disseminate appropriate agricultural technologies by upgrading of INIAA's capabilities to carry out research and by strengthening the National Agrarian University La Molina (UNA). The ATT project design included components in each of the REE components:

Research: Assistance was to be provided to help INIAA to consolidate and upgrade its nine commodity-based National Research programs and its six National Research Support programs. Other activities were to: (1) strengthen INIAA's personnel and research management capabilities; (2) help develop a plan to stimulate private sector involvement in agricultural research; (3) establish a planning and design service for regional and provincial agricultural research activities at INIAA headquarters; (4) provide competitive research grants to university and private sector personnel; and (5) increase UNA's research capacity in areas that complement INIAA's, especially through collaboration between U.S. and Peruvian graduate students.

Extension: Technology transfer was to be improved by establishing within INIAA a regionally-based corps of technology transfer specialists to link researchers and public/private extension and technology transfer institutions. Also, the specialists were to promote technology transfer through the private sector (e.g., producer associations, agribusinesses, and consulting firms). Other activities were to develop up to 10 private sector model technology transfer enterprises (e.g., consulting firms, farm records services), and to help develop an improved seed production and distribution system.

Education: This component was to: (1) strengthen UNA by improving planning skills in the Office of the Rector, revising curricula, creating a system to reward faculty excellence, and expanding faculty understanding of Peruvian agriculture through conferences; (2) support the National Agricultural Library and produce scientific and extension publications; and (3) provide competitive graduate fellowships

for Ministry of Agriculture, INIAA, UNA, regional university and the private sector, including M.S. study (mostly at UNA) for 200 persons and external Ph.D. or comparable programs for 35-40 persons. Long-term technical assistance was to be provided to INIAA by U.S. Title XII universities.

(Note: As explained in Chapter III, the design of ATT was reoriented to implement the project through the private sector.)

The Upper Huallaga Agricultural Development (UHAD) (527-0244) project, programmed to run from 1981 to 1991, also involved agricultural technology generation and transfer but in a defined area (the Upper Huallaga). UHAD, implemented by INIPA and the National Agrarian University of the Jungle (UNAS), was designed to promote agricultural development in the high jungle of the Upper Huallaga region, and minimize the negative social impacts of GOP coca eradication efforts. Under UHAD, INIPA and UNAS were to develop coordinated agricultural research, extension, and training programs, including the following components:

Research: Development and on-farm testing of 15-20 production packages.

Extension: Expansion of extension to encourage farmers to grow new crops, and to develop a livestock program.

Education: Provision of M.S. training to 15 researchers, Ph.D.'s to 3, and short courses to others; and M.S. training to 20 extensionists, B.S.'s to 10, and short-term training for 26. UNAS was to hire and provide short-term training to 25 new faculty, 16 of these earning M.S.'s and three earning U.S. Ph.D.'s. Also, the project was to support 35 agronomy and animal science students per year at UNAS and to upgrade its library and laboratories. (The 6/86 project amendment provided for creation of a community extension training center.)

In June 1988, the project was evaluated; the evaluation concluded that:

The project has made little progress toward its goals due to poor coordination among implementing agencies and violent opposition by the local population. Despite eradication efforts by the U.S./GOP-funded Rural Police Force (UMOPAR) and Coca Eradication Agency (CORAH), coca production still offers enormous economic advantages over [legitimate agriculture]. In most cases, farmers whose coca plantings have been eradicated...simply moved to other areas and continued the practice.... Agricultural research is being carried out, but needs to be focused on developing new higher yielding, disease resistant crops to increase the economic viability of [legitimate agriculture]. An agricultural extension service has been established but its impact has been limited by a lack of interest in [legitimate agriculture]. . . . Conditions have changed so dramatically in UH since 1981 that many...project design assumptions-especially that coca eradication would proceed smoothly and farmers would seek out project assistance-have not come to pass."

A second area-focused project, Central Selva Resource Management (CSRM) (527-0240), was designed to develop, in Perú's Palcazu Valley, a model for long-term development of Perú's high jungle. The project, which ran from 1982 to 1988, was implemented by a special project unit called PEPP (Pichis Palcazu Special Project) within the GOP. CSRM included the following agricultural research, extension, and education components:

Research: This component was to include an adaptive, on-farm research program to determine cropping and livestock systems adaptable to the high jungle, with consideration of the capacity of farmers to absorb new technologies and management practices. Research and extension in livestock development were to focus on pasture development and management linked with cattle and swine production and agricultural, forestry, and animal health activities.

Extension: This component was to include activities in extension, marketing, and local crop processing.

Education: This component was to include a training program stressing materials to help extensionists gather local crop and marketing information; commodity-specific short courses; and having leading producers work with extensionists and commodity experts rotate between research and extension.

Central Selva Resource Management II (CSRM II) (527-0321), designed to run from 1988 to 1990, was a follow-on to CSRM (527-0240). The project was implemented by the National Institute for Development's Pichis Palcazu Special Project (PEPP) and the Regional Development Policy Support Unit (APODESA). With a goal of testing and demonstrating improved technologies for tropical forest and agricultural production/use systems in the Palcazu Valley, CSRM II contained the following agricultural research and extension components:

Research: Introduction and on-farm testing of new forages, animal species, and tree and other crops.

Extension: An extension service utilizing village promoters.

From 1983 to 1990, USAID/Perú provided project funding to assist the Ministry of Agriculture's Agricultural Sector Planning Office (OSPA) in implementing the Agricultural Planning & Institutional Development (APID) (527-0238) project. APID's purpose was to increase the GOP's capacity to formulate agricultural sector policies and to manage implementation of these policies. One APID component was directed at strengthening INIPA in various areas (financial policy/management, internal control systems, and organizational structure). To institutionalize personnel development in the MAF, a Technical Training Division, staffed and managed by the UNA, was to be established.

The project also was to finance U.S. training of 4 Ph.D.'s and 11 M.S.s and in-country graduate (including 70 M.S.'s) and technical training for over 550 professionals; and

to strengthen UNA via fellowships to graduate students and faculty. APID was to finance 15 M.S.'s to assist in establishing an Agricultural Policy Analysis (APA) unit in the University of the Pacific. The 8/87 project evaluation found that several APID components had been successful, including training, and that the project was restoring UNA's former preeminence as a graduate institution.

Analysis

By comparison with USAID support for agricultural research, extension, and education in Bolivia and Ecuador, USAID/Perú has provided longer continuous support, dating from at least 1980. Support was provided through the AREE (1980-89) and ATT (1987-89) projects and was directed primarily at strengthening Ecuador's public sector agricultural research and extension organization, first called INIPA and subsequently INIAA, although assistance also was directed at agricultural education institutions such as UNA and UNAS. Both projects provided assistance to strengthen all three functions--research, extension, and education; thus, the program did not, as was the case with USAID/Ecuador's program or earlier had been the case with USAID's program in Colombia, go through a sequential evolution of initially focusing only on one function (e.g., extension) and subsequently on the others (e.g., education or research). Initially program support was directed at strengthening a lead public sector agency (INIPA subsequently renamed INIAA), although the ATT project, after its initial design, was redirected in 1988 toward implementation by the private sector Foundation of Agricultural Development (FUNDEAGRO) as explained in Chapter III.

While these two projects served to strengthen the national agricultural REE system, area-specific assistance for strengthening agricultural REE capacity also was provided through the Upper Huallaga Agricultural Development and the Central Selva Resource Management (and CSRM II) projects. However, in the case of the former project, the motivating factor was, as in the case of the Chapare Regional Development Project in Bolivia, the desire to find income alternatives to coca production. A key motivating factor in the latter project was, at least initially, the desire to address, as has been the case with the Associated High Valleys component of USAID/Bolivia's Chapare Regional Development project, poverty problems in Perú's high jungle region, while a more recent motivating factor may have been increasing emphasis on the need and desirability of addressing natural resource problems. APID also contributed to development of Perú's agricultural REE system by providing support for strengthening INIPA as an institution. The project continued funding, initiated as early as 1980 under the AREE project, for Peruvians to earn advanced degrees either in-country or in the U.S.

CARIBBEAN REGION

DOMINICAN REPUBLIC

The first USAID/Dominican Republic project initiated during the 1980s that included an agricultural research, extension, or education component was the Natural Resources Management (NRM) (517-0126) project. NRM was implemented between 1981 and 1988 by

the Government of the Dominican Republic's (GODR) Subsecretariat of Natural Resources (SURENA). NRM had two sub-projects: SP01--Natural Resources Planning and Development; and SP02--Soil and Water Conservation. The research, extension, and/or education components of these sub-projects are summarized below.

SP01--Natural Resources Planning and Development

Research: This component was to develop a cartographic base of the DR's natural resources, including aerial photography, first of two target watershed areas, later of the entire nation; also, the project was to develop comprehensive national and watershed-level natural resources development plans. Other studies to be conducted included establishment of 12 erosion and 12 water quality monitoring plots in two SP watersheds; an agricultural zoning study to determine priority farming areas and profitability of selected plant species; 12 marketing studies of major agricultural products; and studies of small farmer groups and associations.

Extension: This component was to introduce soil and water conservation into all GODR road construction plans.

Education: This component was to provide long-term training to 3 Directorate General of Forests (DGF) and 3 SURENA technicians; also, a cadre of DGF field agents was to be trained in conservation forestry. Plans for comprehensive environmental education (via mass media, social/religious groups, public agencies, schools/universities) were to be developed. Environmental short courses for 1,500 school teachers and local leaders and 5,000 farmers also were to be conducted.

SP02--Soil and Water Conservation

Research: This component was to develop a hillside farming systems research (FSR) program that included area characterization, watershed-level and farm register studies, agroecosystem experiments, design and evaluation of production package alternatives, and technology transfer. In each watershed, a farming system and erosion monitoring station and 10 permanent model farms were to be established, with implementation by research teams (three at first) composed of a soil and water specialist, a general agronomist, and an extension agent.
Extension: This component was to support implementation of pilot soil and water conservation programs in two watershed areas, with farmers assisted on a one-to-one basis by 20 conservation paratechnicians and 6 extension agents.

Education: This component was to conduct 16 semiannual short courses to train paratechnicians, and 8 conservation workshops for middle-level field technicians.

A second project with a natural resources focus was Inland Fisheries II (517-0162). This project was implemented from 1982 to 1985 by the Servicio Social de Iglesias Dominicanas (SSID). The project included a research component (economic research on

farmer characteristics and fish production costs), an extension component (fish pond demonstrations), and an education component (short-term training for project personnel).

From 1983 to 1989, the Mission supported the On-Farm Water Management (OFWM) (517-0259) project implemented by the National Hydraulic Resources Institute (INDRHI). The project included the following research, extension, and education components:

Research: Conduct of field studies.

Extension: Demonstration of water management practices.

Education: Provision of short-term, in country training for 500 GODR professionals and 75 technicians; classroom and farm-level training for 25 extensionists; water management training for 1,001 farmers; U.S. Master's degree training for 26 professionals; and short-term training for 31 other persons.

An Agricultural Research and Extension (517-0180) project was designed for the 1987-89 period but never implemented. The project had been designed to assist the GODR with the creation of an autonomous institute to strengthen the capability of private and public institutions to conduct interdisciplinary agricultural research and extension. This objective apparently was pursued through the Commercial Farming Systems project described below.

Commercial Farming Systems (517-0214) started in 1987 and runs to 1992. An Agricultural Technology Development sub-project (03) is developing a private sector-led, non-profit Agricultural Development Foundation (ADF) to guide and finance the generation and transfer of improved agricultural production technologies. The project was to fund the ADF's operating and research support expenses for 18 months. An endowment fund, to be capitalized by contributions from the Government of the Dominican Republic and the private sector, was to be established to ensure ADF's future financial viability. This sub-project's research, extension, and education components are now summarized.

Research: Under this component, ADF was to establish a research program to support the development of improved production technologies for nontraditional crops. Research contracts were to be awarded by ADF to public and private sector research institutions and/or agribusinesses. The project is to emphasize collaborative on-farm research involving agribusinesses and their outgrowers.

Extension: Under this component, an Information Center was to collect and disseminate appropriate technology information and publish/disseminate ADF-sponsored research results. Also, the Center was to sponsor an annual seminar/workshop as well as informal field days at selected sites.

Education: This component was to conduct two technical courses for 60 cooperating researchers.

Two USAID/Dominican Republic projects in the 1980s provided support for agricultural education. The first, Agricultural Sector Training (517-0160), from 1983-1991, is being implemented by the National Planning Office, Department of International Technical Cooperation (ONAPLAN/DITC). This project is providing advanced training for public sector and university personnel, and is establishing ongoing systems for assessing training needs and financing training (participant training for 80 M.S. and 15 Ph.D. degrees). University participants, upon completion of studies, are to return to the DR and help establish new graduate programs in agricultural science. Also, a Fund for Advanced Education was to be established to finance 35 M.S. scholarships and in-country thesis research at domestic universities.

A second education-related project, Agribusiness Training (517-0243), is being implemented between 1989 and 1991, by the private Superior Institute of Agriculture's (ISA) Center for Rural Development Administration (CADER). Also, the project is providing opportunities for private sector research and short-cycle training for agribusiness owners and managers.

Analysis

USAID/DR support for agricultural research, extension, and education during the 1980s initially focused on the NRM project. The Natural Resources Planning and Development sub-project emphasized development of basic information and environmental education training plans. The extension focused on introducing soil and water conservation in GODR road construction plans and conducting environmental short courses for farmers. The Soil and Water Conservation sub-project focused on agricultural technology generation and transfer, including a hillside FSR program, pilot extension programs emphasizing soil and water conservation, and short courses for paratechnicians.

While NRM emphasized the soil, water, and forest components of the DR's natural resources, Inland Fisheries focused on the potential to produce fish in ponds. However, whereas NRM was implemented by public agencies, Inland Fisheries was implemented by a NGO. A second water-related project, OFWM, focused on the potential of irrigated agriculture and included research, extension (water management demonstrations), and education components. As in the NRM project, OFWM was implemented by a public agency.

While an Agricultural Research and Extension (517-0180) project was designed by USAID/DR during the mid-1980s, this project apparently was shelved. The intent of this project's design was to create an autonomous institute to strengthen the capability of private and public institutions to conduct interdisciplinary agricultural research and extension. Apparently the Mission decided not to pursue this objective through a public sector organization but rather by creating a private Agricultural Development Foundation (ADF). The ADF is being implemented under the Commercial Farming Systems project's Agricultural Technology Development sub-project that emphasizes a private sector-led institution to guide and finance agricultural technology generation and transfer, with an emphasis on collaborative on-farm research.

While the Agricultural Technology Development sub-project of the Commercial Farming Systems project does not include a strong education component (support was limited to two technical courses for cooperating researchers), support for agricultural education is being provided under Agricultural Sector Training (1983-1991) and Agribusiness Training (1989-1991). The former project, while offering opportunities for advanced training, is notable in that the project's design provides support for the establishment of ongoing systems for assessing training needs as well as for the financing of overseas M.S. and Ph.D. training, with the objective of having participants, upon completion of their degrees, return to the DR to help establish new graduate programs in agricultural science. Also, the project design provides for the establishment of a Fund for Advanced Education to finance M.S. scholarships and in-country thesis research at domestic universities. The latter project, Agribusiness Training, is of note in that it supports development of short-cycle training by the Superior Institute of Agriculture (ISA), a private agricultural education organization. Further, while providing short-cycle training for agribusiness owners and managers, the project also is developing opportunities for private sector research.

It should be noted that USAID/DR provided project support during the 1970s to strengthen the Superior Institute of Agriculture (ISA). In 1962, a group of community leaders sought to remedy the DR's lack of trained agricultural manpower by creating ISA as an agricultural high school. Later ISA was expanded to include, through a local university, an undergraduate degree program; also, a specialized non-degree program in rural development was added. Subsequently the school gained status as an autonomous university.

A special evaluation of ISA (Hansen, et al., 1988) found that the school's impacts have been numerous and important. The school's training is generally regarded as excellent. Former as well as current faculty are involved in national decisionmaking regarding agriculture and rural development, either indirectly (via research) or directly (via government employment or consultation). The evaluation found that ISA faculty had conducted innovative commodity research leading to foreign exchange savings and had influenced government policy on critical issues such as agrarian reform and reforestation.

Factors identified as contributing to ISA's vitality were: continuous, strong leadership from the school's founding group; early institution-building inputs by Texas A&M University (made available through USAID/DR project support); responsiveness to societal needs; innovative training and other programs funded by the GODR's Secretariat of Agriculture, USAID, and other donors; and ISA's own commitment to quality education. Constraining factors identified included: an overly theoretical curriculum; insufficient links with research and outreach activities; and pressures on ISA to turn to the private sector in the face of dwindling government and donor support and to reduce or terminate the school's technical/vocational program. Giving in to the former pressure would divert ISA's attention from the small-farm sector, while giving in to the latter would make even worse the present shortage of lower- and mid-level agricultural technicians.

HAITI

From 1978 to 1988, USAID/Haiti funded the Agricultural Development Support II (ADS) (521-0092) project that was implemented by the Ministry of Agriculture, Natural Resources and Rural Development (MOA). ADS sought to strengthen the capability of the MOA to develop "packages" of technological recommendations for farming systems, maize, sorghum, legumes, vegetables, coffee, sugar cane and forestry. Research-derived recommendations were to be distributed to small farmers through the national extension service. The Ministry's agricultural research division, SERA, was to refine the packages on a regular basis. Under ADS, SERA was to be reorganized and a coordinated research program established in maize, sorghum grain, legumes, tropical horticulture, sugar cane, soil conservation, forestry, vegetables, livestock, and forestry management.

The 5/86 mid-term evaluation of ADS found that the project's farming systems research and extension had focused

> exclusively on-farm, agronomic testing and...lacked input from project socioeconomists (who were placed in a separate unit). As a result, the project [had] not fully characterized farming systems within zones nor identified farmer problems and constraints. Further, extension efforts [had] not yet studied rural institutions and their effect on technology adoption.

The project evaluation summary concluded:

> Due to project implementors' focus on crop testing rather than on farmer adoption of new technology, quantitative measures of production and farm income increases are lacking; such increases depend, in any case, on the still future adequate extension service. The latter, in turn, will be effective to the extent that it adopts the FSR approach rather than traditional 'vulgarization,' 'model farms,' or 'integrated development' approaches which have left so many sad reminders all over the Haitian landscape.

From 1983 to 1988, Agricultural Cooperative Development International (ACDI), held a Cooperative Agreement with USAID/ Haiti, under NGO Support I (521-0169), for conducting feasibility studies and pilot tests of producing winter vegetables for export and for developing an agricultural station as a center to service production of such vegetables by small- to medium-sized farmers. A pilot farm was to be established to carry out variety, density fertilization, and other trials to test feasibility with minimum export quantities. This project, in effect, was an initial foray into non-traditional agricultural export (NTAE) crops.

Another area in which USAID/Haiti has provided support for agricultural research and extension has been agroforestry. From 1981 to 1989, the Mission supported the Agroforestry Research (521-0122) project that was implemented through three PVOs--the Pan American Development Foundation (PADF), CARE, and Operation Double Harvest (ODH). This project included research and extension components, as follows:

Research: This component provided for ODH to conduct forestry research. The 12/14/84 project amendment extended the project from 9/85 to 12/86 in order to contract a Title XII university to conduct an independent agroforestry research program. The 11/6/86 project amendment extended the PACD three years through 12/89. The Project Evaluation Summary of the end-of-project evaluation noted that: "The use of the University of Maine (UM) rather than [PVOs] to conduct problem solving research was sound, although there is need for a comprehensive plan to address outstanding research issues and to clarify the functions of the UM team and its relation to the PVO research units."

Extension: This component provided for the establishment of demonstration tree farms by ODH in diverse ecological zones and demonstration of appropriate soil conservation measures. The PVOs were to work with animators of HACHO, a quasi-governmental Haitian development organization, to make local contacts through 800-900 village meetings. CARE/HACHO was to conduct demonstration tree plantings, while the PADF was to establish an Agroforestry Resource Center and three regionally-oriented extension teams to provide agroforestry training to interested PVOs and local councils and groups.

In the mid-1980s, USAID/Haiti initiated the Target Watershed Management (521-0191) project. The project, which is scheduled to run from 1986 to 1991, is being implemented by the MOA. Under the project, the MOA is conducting research on model experimentation and demonstration plots to test land-use sequences for improving crop yields and farmer income and preventing erosion. The research results are to be used to develop locally-validated technical packages (most of which are to include alley cropping) for transfer to watershed farmers. As the experiments will take years to assess, the project is currently involving farmers in mini-experiments comparing traditional to improved technologies on their own farms. Activities with farmer are to be implemented through PVOs.

Agroforestry Program (521-0217), the follow-on project to Agroforestry Research (521-0122), is scheduled to run from 1990 to 1995. The project is being implemented by two outreach grantees and a Title XII contractor. The project has research and extension components, as follows:

Research: This component supports an operations research program to develop sustainable, small-farm agroforestry production systems by integrating trees, forages, and other soil-conserving and fertility-enhancing perennial crops with traditional annual food crops.

Extension: This component provides for extension and training in rural communities.

Analysis

Three areas of emphasis appeared in the USAID/Haiti agricultural portfolio during the 1980s. At the decade's outset, the Mission's ADS project being implemented by the public sector MOA already was supporting and continued to support through 1988 the farming

systems research and extension (FSR/E_ approach to developing "packages" of technological recommendations, primarily for subsistence food crops (e.g., maize) but also for export crops (e.g., coffee and sugar cane). The project also provided for a FSR/E approach to forestry. The mid-term evaluation of the ADS project noted a number of problems with implementing FSR/E that also have been encountered in other countries that have sought to implement FSR/E as a model for agricultural technology generation and transfer (Byrnes, 1990a).

During the middle part of the decade, the Mission began, under NGO Support I to place greater emphasis on non-traditional agricultural export crops, specifically, winter vegetables. This project, by comparison to ADS, placed greater emphasis on working directly with the private sector, with the project's technical assistance being provided by ACDI. The third area emphasized in the Mission's agricultural portfolio during the 1980s was that of forestry, first with Agroforestry Research (1981-89), implemented by the MOA, then Target Watershed Management (1986-91), implemented by PVOs.

While the MOA's agricultural research division, SERA, was to have been reorganized under the ADS project, the agricultural projects in the Mission's portfolio placed little to no emphasis on building public or private institutions to carry out agricultural research, extension or education. Indeed, none of the projects in the portfolio placed any emphasis on agricultural education. Generally, the projects in the portfolio emphasized providing the inputs needed for implementation of a project, albeit the implementing agency a public or private organization. This identified lack of emphasis on institution building also was evidenced in the Mission's reliance on ACDI for implementing the NTAE initiative and the University of Maine to conduct an independent agroforestry research program. Generally, the Mission placed increasing emphasis over time on working with PVOs rather than with the MOA.

JAMAICA

The first USAID/Jamaica project involving an agricultural research, extension, and/or education component during the 1980s was Agricultural Education (532-0082), scheduled to run from 1984 to 1990. Implemented by the Government of Jamaica's (GOJ) Ministries of Education and Agriculture, this project included education and extension components, as follows:

Education: This component provided support for upgrading (facilities construction, faculty strengthening, and curriculum development) the College of Agriculture and feeder secondary school, Knockalva Agricultural School. An objective was to increase the college's enrollment from 150 to 450, with 100 A.Sc. graduates annually.

Extension: This component provided support for a College of Agriculture Applied Research Center that was to extend new technologies (developed in conjunction with the MOA and Agro 21, a GOJ agricultural project) to farmers.

The 1/89 Project Evaluation Summary of the project's mid-term evaluation noted that this project had experienced "a lag in...applied research. Extension/outreach activities and curriculum development have proceeded at a faster pace...."

In 1986, USAID/Haiti launched the Jamaica Agricultural Research (532-0128) project. This project, scheduled to run to 1993, is being implemented by the private Jamaican Agricultural Development Foundation (JADF). The project is promoting adaptive commodity research by establishing, under the aegis of JADF, a Research Advisory Council (RAC) to determine research priorities and plans, fund/coordinate research efforts, promote scientific links, and fund short-term training of Jamaican researchers. Composed of representatives of farmers, exporters, financiers, agribusiness, agricultural education, the Ministry of Education (MOA), and others, the RAC is responsible for developing priority criteria for commodity research and using project funds to make grants to public and private individuals and organizations, national and international institutions, commodity boards, and other agencies to conduct specific, applied research and on-farm trails. The focus of contracted research, which is to be conducted mostly in farmers' field, on key commodities such as root crops, legumes, and cereals.

From 1985 to 1989, the Hillside Assessment (532-0113) study was conducted to identify economically viable hillside agricultural production systems. Phase I studies and reviews were to be used during Phase II to identify a follow-on hillside agricultural project to be funded by USAID/Jamaica. During Phase III, technical, economic, social, and institutional analyses for the follow-on project were to be prepared.

The Hillside Agriculture (532-0101) project was designed to be implemented from 1987 to 1994. The project, which is being implemented by the Ministry of Agriculture, includes research and extension components, as follows:

Research: This component is to test and promote perennial cropping systems and improved tree crop practices in two ecologically important watersheds in a manner consistent with soil conservation principles.

Extension: This component, which is to educate farmers as to the complexities of changing domestic and export markets, is to utilize lead farmers in extension efforts.

The 3/29/90 Project Evaluation Summary of an interim evaluation of the his project reported that Hillside Agriculture has been successful in promoting the production of income-producing perennial tree crops and merits continued support. The evaluation recommended that greater attention be paid to the management of information generated by sub-projects and that soil conservation principles be integrated into ongoing sub-projects. But the evaluation expressed concern that may sub-projects are susceptible to a tendency that haunts rural development projects: those individuals with more and better organized resources benefit most from development assistance.

Analysis

During the 1980s, USAID/Jamaica support for strengthening Jamaica's agricultural technology generation and transfer system initially focused on implementation of a project, Agricultural Education, that was aimed at upgrading the College of Agriculture and its feeder secondary school, Knockalva Agricultural School. While this project included extension, the project evaluation found that "a lag in...applied research" was a constraint on implementing the project's extension component. However, the need for a greater emphasis on agricultural research was recognized even earlier in the decade, when the Mission launched the Jamaica Agricultural Research project. This project, which is being implemented by the private JADF, is providing support for adaptive commodity research carried out in farmers' fields. Also, this project's commodity focus includes research on crops that are currently being exported and/or have the potential for export.

The second project involving research, extension, and/or education, in the USAID/Jamaica portfolio has been the Hillside Agriculture project. This project, implemented by the Ministry of Agriculture, focuses testing and promoting perennial cropping systems and improved tree crop practices appropriate to fragile hillside ecology of Jamaica's watersheds.

REGIONAL DEVELOPMENT OFFICE FOR THE CARIBBEAN (RDO/C)

The primary target group of countries of AID's Regional Development Office for the Caribbean (RDO/C) is the countries of the Eastern Caribbean. RDO/C support for agricultural research, extension, and education in the Eastern Caribbean primarily is directed through regional organizations such as the University of the West Indies (UWI) and the Caribbean Agricultural Research and Development Institute (CARDI).

From 1982 to 1989, RDO/C continued its project support for development of agricultural extension in the Eastern Caribbean by supporting Caribbean Agricultural Extension - Phase II (538-0068) (CAEP). Implemented by the UWI, CARDI, and national MOAs, this project sought to upgrade agricultural extension systems in the six Eastern Caribbean states (Antigua, Dominica, Montserrat, St. Kitts/Nevis, St. Lucia, and St. Vincent) and Belize. Links with agricultural research were to be developed through a Technical Joint Action Committee composed of representatives from CAEP, UWI, and two regional organizations--CARDI and CARDATS (Caribbean Rural Development and Advisory Training Service). The process of developing these links was to be facilitated via a Regional Agricultural Extension Coordinating Committee that included representatives from countries, regional research organizations, commodity associations, farmers, and donors. CAEP was to establish agricultural extension communication and information units within each country and a Regional Extension Communications Unit within UWI's Department of Agricultural Extension. Private sector agricultural extension institutions were to participate widely in the project's activities. CAEP also contained an education component that provided support for degree, inservice, and graduate (or postgraduate) training as well as for workshops.

The 10/84 External Evaluation of the project found that CAEP had made

> progress toward most goals, being especially effective in motivating ministry attention to, and administrative restructuring of, [agricultural extension]. National agricultural planning committees have been formed, job descriptions formulated, and communication lines, management procedures, and concrete work plans (the latter for national, district, and extension agent...levels) developed in most countries. [Extension agent] supervision has been strengthened through supervisor training, and performance and reporting standards. The establishment of a regional program to recognize outstanding [extension agents] has helped increased professionalism and morale.

CAEP demonstrated potential for impacts on farmers in such areas as crop diversification and quality, and fertilizer and pesticide use. In 1984, farmer contacts increased by 50% over 1983.

On the other hand, the evaluation also found that extension continued to be hindered by lack of materials, transportation, and housing and by limited formal training of extension agents. While the project had increased in-country and regional training opportunities, two key programs (Diploma in Agriculture and in Extension) had fallen short of expectations, the former plagued by lack of qualified candidates, the latter being too theory-oriented. Key needs identified included improved linkage of extension with research, private associations, education institutions, and marketing. Other identified needs were to strengthen the efforts of regional agricultural extension, improve working relationships with CARDI, and provide more vehicles for extension agents and attention to training and recruitment. Also, there was a need to use marketing information in planning.

Subsequently, the 6/30/89 Project Assistance Completion Report (PACR) reported that CAEP had significantly strengthened the effectiveness of national extension services through better organization, the development of more clearly defined goals, and enhanced staff skills. Frontline extension officers had acquired a greater knowledge of appropriate agricultural practices and the ability to apply them to improve farm production. Further, national communication units were formed or strengthened in all project countries, and had become especially effective in the areas of work program planning, training, and the production of communications materials for publications. A regional extension communications unit at UWI was established, UWI outreach positions in the Windward and Leeward Islands institutionalized, a regional agricultural extension coordinating committee created, and regional links strengthened. As a result of the project, target families increased enterprise receipts, farm and family earnings, and net worth; adopted several new production and management practices; gained greater knowledge of production and marketing; and demonstrated improved attitudes toward farming and extension.

From 1983 to 1989, RDO/C supported the Farming Systems Research and Development (FSRD) (538-0099) project. FSRD was a follow-on to the Small Farms Multiple Cropping Systems Research project (538-0015) which ran from 1978 to 1982. The

objective of FSRD was to develop a farming systems R&D program in CARDI. The project included research, extension, and education components, as follows:

> Research: This component included support to strengthen CARDI institutionally to carry out FSR. Specifically, the project was to provide assistance in establishing a Research Advisory Board to guide long-term research and promote staff professionalism; financial, planning, reporting, and evaluation procedures; and project-related administration and management systems.
>
> Extension: The component provided support for CARDI to work with public and private extension organizations, especially the Caribbean Agricultural Extension Project (CAEP) and MOA personnel, to develop a systematic approach to transfer improved technologies via the FSR method. Extensionists were to work with CARDI teams at the technology generation phase and to assume a supervisory role at the applicability testing phase; at least five such tests per island were to be conducted by the project's final year. Extensionists were to conduct mass campaigns to transfer successful technologies.
>
> Education: This component provided support for CARDI to conduct FSR training, including workshops and on-the-job training, for at least 25% and 50% of participating extensionists and MOA research personnel, respectively. Also, support was provided for seminars (and some short-term U.S. technical training) for at least 75% of its staff.

The 9/87 Project Evaluation Summary reports that FSRD's problems were intrinsic to

> a project design that was too ambitious and unrealistic, especially with regard to time frame, the availability of host government counterparts and financial support, and project sustainability. Also, the 'bottom-up' style of FSR/E has proven very slow in an environment used to a 'top-down' style. Finally, the amount of development effort (as distinct form pure research) needed to test and validate the technologies was underestimated. The research staff has a very limited capacity to respond to such developmental demands on which the success of research ultimately hinges.

On the other hand, the 3/89 Final Report noted that FSRD was successful in developing "several improved technologies which were adopted at the farm level.... As a result of the project, CARDI developed and implemented a structured annual planning, budgeting, and reporting process; a microcomputer-based management system and strategic plan; a performance appraisal system; and a planning and evaluation unit."

From 1984 to 1987, RDO/C supported the St. Vincent Agricultural Development (538-0101) project that was implemented by the Ministry of Trade and Agriculture, CARDI, and a PVO (Organization for Rural Development). The project included both research and extension components, as follows:

Research: Screening by CARDI of high-yielding varieties of carrots, sweet potatoes, peanuts, and onions, using a FSR approach to identify economically optimum fertilizer levels and other practices.

Extension: Dissemination by the Ministry's Extension Unit of research results to farmers.

However, the 9/87 Project Evaluation Summary reports that the project "did not achieve the hoped-for level of success, and it failed to institutionalize its activities."

> a cumbersome strategy inhibited research activities such that adoption rates did not produce the expected doubling of output, and little progress was made in upgrading [MOA] research facilities and equipment.

Also, the 12/87 Final Report noted that "there was little success in research or training activities," that research facilities and were not upgraded, and that varietal trials had little impact.

During 1986-87, RDO/C supported the Food Crop Production (538-0007) project that was implemented by CARDI. The project sought to provide regional service, with emphasis on LDCs, for research, extension (demonstration), and training. Under project funding, CARDI was to establish an outreach program of applied research, demonstration/extension, and training in a selected number of food crops, in order to develop small farmer food cropping systems. The project was to be conducted in three pilot territories (in Belize, St. Kitts, and St. Lucia) through establishing three pilot operation/demonstration centers that would conduct adaptive research and promotional, extension, and training activities.

For the period 1989-94, RDO/C is supporting the Agricultural Research and Extension project (AREP) (538-0164). The project is being implemented by CARDI, UWI, and collaborating host country MOAs. The project involves research, extension, and education components, as follows:

Research: Generation of improved technologies by CARDI-coordinated multi-country collaborative research networks. A farming systems methodology, developed jointly by CARDI, UWI, and MOA staff, is to be used to identify country-level problems and develop alternative technologies and production systems for specified target groups of farmers. These technologies are to be tested in CARDI's crop and animal programs and at selected experimental stations, and validated on-farm. Project-supported research is to address crop production, livestock production, and technology adaptation and transfer, with an emphasis on farm productivity and socioeconomic stability.

Extension: Upgrading of national extension services by UWI through (1) institutionalization of a farm/home management approach which analyzes farm enterprises as an economic unit and stresses recordkeeping and decisionmaking techniques; (2)

development of communications support systems (with emphasis on radio and video programming) via strengthening (a) the capability of the UWI Regional Extension Communications Unit to produce instructional materials, and (b) strengthening national communications units; (3) provision of awards for excellence in extension; and (4) promotion of research/extension links via farmer meetings at the district level and workshops/conferences on gender-related issues. The project is to ensure research/extension links through: (1) CARDI-UWI-MOAT Extension Service committees in host countries; (2) policy reviews by project management; (3) creation of joint CARDI-UWI offices; (4) participation of UWI and CARDI personnel in each other's planning; and (5) researcher/ extensionist collaboration in sondeos and technology validation. Private sector groups will participate by attending workshops, visiting experimental stations, etc.

Education: Training of extensionists--postgraduate degrees at UWI, training of mid-level extension managers, and regional and national short courses, seminars, and workshops.

Analysis

RDO/C has been providing long-term support for the development of agricultural research, extension, and education in the Eastern Caribbean. This support has been directed at strengthening regional institutions such as CARDI and the UWI. Since the late 1970s the Mission supported the CAEP (Phase I, 1978-81 and Phase II, 1982-1989) as a regional mechanism for strengthening national extension systems and promoting the participation of private sector agricultural extension institutions. The project encouraged linkages with research organizations (CARDI and the UWI) and provided funding support for degree, inservice, and graduate (or postgraduate) training as well as for workshops.

RDO/C similarly supported since the late 1970s projects to strengthen agricultural research in the Eastern Caribbean. The Mission provided support for the Small Farms Multiple Cropping Systems Research project from 1978 to 1982, and for the follow-on FSRD project from 1983 to 1989, the latter project directed at developing a farming systems R&D program in CARDI. Also, FSRD included extension and education components. However, the evaluation of the project concludes that the project's design had been "too ambitious and unrealistic," especially in regard to time frame, availability of host government counterparts and financial support, and project sustainability. Also, the amount of development effort (as distinct form pure research) needed to test and validate the technologies was underestimated.

In short, the problems identified in the evaluations of the FSRD project and of the St. Vincent Agricultural Development project parallel those identified in a recent review of AID experience with FSR/E projects (Byrnes, 1990a). Yet the Final Report on FSRD found that the project had developed improved technologies which were adopted by farmers. As a further result of the project, CARDI had been institutionally strengthened to support FSR/E through implementation of an annual planning, budgeting, and reporting process; a microcomputer-based management system and strategic plan; a performance appraisal system; and a planning and evaluation unit.

As experience was gained, CARDI sought to provide regional service for research, extension, and training. This was the strategy of CARDI's Food Crop Production project during the late 1980s. This project sought to establish an outreach program of applied research, demonstrations, and training in a selected food crops, in order to develop small farmer food cropping systems in three pilot territories (Belize, St. Kitts, and St. Lucia).

This regional approach continues to be emphasized in the current (1989-94) Agricultural Research and Extension (AREP) project that is being implemented by CARDI, UWI, and national MOAs. This approach emphasizes CARDI's role in:

1. coordinating multi-country collaborative research networks;

2. participating in development of FSR methodology to identify country-level problems and generate alternative technologies and production systems for specified target farmer groups; and

3. testing these technologies at experimental stations, and validating the technologies on-farm.

Further, the project provides continued support for strengthening UWI's extension and education capabilities.

In the past, RDO/C support for agricultural research and extension were split between at least two projects (in the 1970s between the Small Farm Multiple Cropping Systems Research and the Caribbean Agricultural Extension Project (CAEP), in the 1980s between Farming Systems Research and Development and CAEP-II). Currently, however, RDO/C support for agricultural research and extension is channelled through one project providing support for CARDI (for research) and UWI (for extension and education). Further, this project is providing regional support aimed at strengthening the capability of national-level extension systems to transfer technologies generated and validated through CARDI's ongoing farming systems research program.

CENTRAL AMERICAN REGION

BELIZE

From 1983 to 1992, USAID/Belize is providing support for the Livestock Development (505-0006) project being implemented by the Ministry of Natural Resources (MNR); the project includes the following extension and education components:

Extension: Teaching of improved pig production to 850 farmers; also, provision of technical assistance to help farmers and extensionists develop model pasture programs for dairy and beef cattle production.

Education: Provision of swine improvement training to MNR staff at the Central Farm (agricultural research station) and to extensionists, improvement of extension

training at the Belize School of Agriculture (BSA), and development of forage and pasture curricula for BSA. Training under the project is to include an M.A. in agricultural economics, a Ph.D. in quantitative methods, 3 B.S.'s (in swine, forage, and dairy production), and short-term regional training for two MNR staff.

Mission support for projects development of non-traditional agricultural export (NTAE) crops began with the Commercialization of Alternative Crops (505-0008) project in 1985. This project, scheduled to run through 1990, is being implemented by the Belize Agri-Business Company (BABCO) and Ministry of Natural Resources (MNR). The project, designed to increase production of non-traditional crops for export and import substitution, includes research, extension, and education components, as follows:

Research: Subcontracting of U.S. packers/shippers with established markets to identify non-traditional export crops and producers as well as the need for additional information or services (e.g., field trials, soil analyses, assistance with pest and weed control). For import substitution crops, determination of the feasibility of producing and processing soybean and sesame varieties, and arranging field testing (probably through CARDI). Also, the technical assistance contractor is to work with CARDI and the MNR to develop a research program to increase yields of staples for local markets and to ensure that pesticide use associated with the project is in accordance with AID regulations.

Extension: Provision of a management consultant to help the MNR define its role in promoting nontraditional crops and develop a specific plan for MNR strengthening.

Education: Provision of on-the-job training to execute the MNR strengthening plan. Between 1987 and 1992, the Toledo Agricultural Marketing (505-0016) project, being implemented by the private sector with technical assistance from a U.S. PVO, is developing agricultural research, extension, and education activities, as follows:

Research: Support for adaptive research and extension of improved postharvesting technologies for rice (potential export crop) and staple crops.

Extension: Introduction of new cash crops (specifically coca) and helping farmers' organizations to manage cocoa processing and marketing. Farmers are to be assisted during the critical first 12 months of cocoa tree growth by demonstrations and farm visits. Also, the project may help some farmers establish on-farm cocoa fermenting/drying units.

Education: Training of farmer organization personnel in pest management and chemical handling. Also, provision of agricultural training (technical through M.S. levels) to selected Toledo residents.

From 1984 to 1988, USAID/Belize provided support for the Special Development Activities Fund (505-0010) project that was implemented by the Ministry of Natural Resources (MNR), the Peace Corps, Roman Catholic Church, and two District communities.

The project focused on education, with the objective of establishing the Belize Junior School of Agriculture to provide a two-year course in agricultural education, especially to non-high-school-bound primary school leavers aged 14-16. Students completing the course and establishing their own agricultural enterprises were eligible to receive non- or low-interest loans from a revolving fund and technical assistance from schooi staff.

Analysis

USAID/Belize support for agricultural research, extension, and education primarily has been directed to providing inputs to support implementation of specific production-oriented projects by public and/or private organizations. Some projects provided funds to support degree-level training; however, the principal emphasis has been on extension or technology transfer to support improved production. Excepting Livestock Development, which provides support for improvement of extension training at the BSA and development of the school's forage and pasture curricula, the Mission's projects generally have not been aimed at strengthening public or private research/extension/education organizations. While located in predominantly Spanish-speaking Central America, Belize as an English-speaking country tends to look to CARDI for technical support on food (staple) crops, In the area of NTAE crops, increasing emphasis has been placed in recent years on working with the private sector. Livestock Development is one of the few livestock projects in the USAID-funded LAC portfolio.

COSTA RICA

USAID/Costa Rica's portfolio had only two projects during the 1980s that contained agricultural research, extension, and/or education components. The first project, NTAE Technical Support (515-0237), being implemented from 1987 to 1991 by the Costa Rican Coalition of Development Initiatives [CINDE (Coalición Costarricense de Iniciativas de Desarrollo)]/Private Agribusiness and Agroindustrial Council (CAAP). The project includes the following research, extension, and education components:

> Research: This component is to finance special studies to identify opportunities for non-traditional agricultural export crops (NTAEs). Areas for possible study include commodity reporting for major NTAE crops, business climate, etc. Studies to determine which crops to support under the production/marketing component were also to be financed.
>
> Extension: This component provides technical assistance for production, marketing, and design and dissemination of an investment package. Provision of short-term technical assistance directly to NTAE producers and exporters in such areas as cultural practices, pest/disease control, soil and water management, use of market information, export procedures, and marketing of products that do not meet fresh export grades. Includes 12 months of in-country training.

The second project, Northern Zones Consolidation (515-0235), that reportedly contains research and extension components, had not information available in AID's Center

for Development Information and Evaluation (CDIE). USAID/Costa Rica is now developing a new project called Forest Resources for a Stable Environment (FORESTA) (515-0243). Scheduled to start in late 1990, FORESTA will promote forestry and agroforestry in buffer zones around several national parks and support management of the parks. As a component of the project, farmers will be encouraged to establish forest plantations on marginal agricultural land.

Analysis

Funding for agricultural research, extension, and education by USAID/Costa Rica has been limited to meeting the specific TA objectives (special studies, adaptive research, technology transfer, or training) that need to be met to develop specific NTAE opportunities. Some of the adaptive research involved is being carried out under contract with the University of Costa Rica. In other words, Mission support to CINDE/CAAP, recently reorganized as CINDE/División Agrícola (DIVAGRI), has not been for creating or strengthening CINDE/DIVAGRI as a research, extension, and/or education organization. But several USAID/ ROCAP projects provide support for projects that are being implemented by organizations (e.g., CATIE, EARTH) located in Costa Rica.

EL SALVADOR

The Agrarian Reform Sector Support (ARSS) (515-0265) project, implemented by Government of El Salvador agencies [e.g., the Ministry of Agriculture (MOA)] between 1983 and 1988, included the following research, extension, and education components:

Research: Support of MOA programs in crop research for Agrarian reform beneficiaries.

Extension: Support of MOA extension programs for Agrarian Reform beneficiaries, including formation of farmer "grupos solidarios" and commodity associations and communications programs (especially daily radio broadcasts).

Education: Support for the MOA's Center for Training (CENCAP) to offer short-term training to government agency personnel, cooperative personnel, and some 10,000 farmer leaders. Overseas training was to be provided to CENCAP personnel. Support also was to be provided for the National School of Agriculture (ENA) to improve its farm management, extension, and small farms curricula, renovate facilities, and arrange faculty training.

In January 1985, a grant was made under the ARSS project to the Salvadoran Foundation for Economic and Social Development (FUSADES) for an agricultural diversification program (ADP) that is known in Spanish as DIVAGRO. The grant was to assist FUSADES in (1) organizing the ADP; (2) establishing a data base on agribusiness and agricultural diversification opportunities and resources; (3) disseminating this information; and (4) administering a fund to finance pre-investment feasibility studies and short-term technical assistance to producers of NTAE products.

It was also in 1985 that USAID/El Salvador initiated the Water Management (519-0303), implemented by the Ministry of Agriculture (MOA) and FUSADES. Scheduled to run through 1991, this project is aimed at promoting the production of non-traditional agricultural export (NTAE) crops through irrigation development. The project includes extension and education components, as follows:

Extension: Provision of training in irrigation and export-oriented agriculture to public sector extensionists from the Agricultural Technology Center (CENTA), private sector extensionists, CENTA researchers, and innovative farmers.

Education: Development of a B.S. curriculum in irrigated agriculture at the National School of Agriculture (ENA) and provision of M.S. training opportunities for four ENA professors. Training of planners, technicians, and policymakers from the Directorate of Irrigation and Drainage (DGRD), the Agricultural Sector Planning Office (OSPA), and the Office of Water (OA) in program planning and evaluation, and in research on irrigation policy.

Beginning in 1987, additional support for FUSADES/DIVAGRO has been provided under the Agribusiness Development (519-0327) project, which is scheduled to run through 1994. The project, being implemented by FUSADES, includes an extension component that is providing technical assistance to private enterprises that produce and/or export non-traditional agricultural products. Technical assistance is provided to private domestic companies, including those engaging in joint ventures with eligible foreign investors, and to private sector producer and agrarian reform co-ops. These enterprises may be new or expanded, large or small, producers, processors/packers of products grown by others, or export brokers. All crops are eligible except coffee, cotton, sugar, and crops whose export would notably affect U.S. exports. The project is financing additional DIVAGRO staff needed to implement the project and continuation of DIVAGRO's operations that originally were funded under the ARSS project (which ended 7/88).

The Community Based Integrated Rural Development (519-0364) project, which began in 1989 and runs to 1994, is being implemented by the Save the Children Federation (SCF). The project, designed to strengthen community capacities in the agricultural, education, health/nutrition, and small enterprise sectors, is providing assistance to two impact areas in La Union, and is reinforcing community development activities in four impact areas assisted under predecessor projects. The project includes an extension (technical assistance) component for 3,500 farmers in such areas as grain production, animal husbandry, crop storage and marketing, natural resource conservation, irrigation, crop diversification, and small enterprise development.]

Two projects are to begin in 1991. First, USAID/El Salvador will provide support for a three-year Coffee Technology Enhancement (519-0362) project which will seek to improve the level and quality of coffee production of small-scale producers. This project, to be implemented by the private El Salvador Coffee Cooperatives Union (UCAFES), will provide an extension component that includes training for a cadre of agronomists working through UCAFES to provide technical assistance.

A second three-year project, Commercial Farming (515-0351), also to be implemented by private sector organizations (PVOs and cooperatives), will help 60-70 of the best cooperatives to produce NTAE crops and to develop links with agribusinesses processing such products for export. An extension component will provide technical assistance in management and agronomic techniques.

Finally, beginning in 1992, the five-year Sustainable Agricultural Production (519-0374) project will seek to improve the sustainable agricultural production and productivity of small farmers and to improve the natural resources framework within the country. The sustainable agricultural production component will focus on improving and diversifying small farmer production through the introduction of various cropping systems and conservation techniques. This component will explore other activities (e.g, reforestation and introduction of integrated pest management practices in agricultural production).

Analysis

USAID/El Salvador support for agricultural research, extension, and education in the 1980s initially was directed to the Agrarian Reform Sector Support (ARSS) project, with assistance primarily aimed at agrarian reform beneficiaries, although the project also assisted in strengthening ENA (National School of Agriculture) and provided funding to FUSADES/DIVAGRO to develop non-traditional agricultural export (NTAE) crops. The focus on NTAE crops was given further impetus under Agribusiness Development which provides funding for FUSADES/DIVAGRO to work directly with the private sector to develop NTAE crops. The emphasis on working through the private sector was continued under the Water Management and will continue to be emphasized in the Coffee Technology Enhancement, Commercial Farming, and Sustainable Agricultural Production projects.

None of the projects throughout the 1980s was aimed at strengthening the public sector Agricultural Technology Center (CENTA), the country's public sector agricultural research and extension organization. However, in recent years, the Mission has expressed concern over the performance of CENTA. While a PID for a project to create a private sector Agricultural Development Foundation was prepared in late 1988 (Hertford, Brown, and Moscardi, 1988), a decision was not made to prepare a PP for such a project. More recently, the Mission has begun to explore the possibility of assisting the MOA and the private Fundación Empresarial para el Desarrollo Educativo (FEPADE) with conducting a series of pre-design assessments and studies that would provide the basis for developing a strategy to privatize ENA (Byrnes, 1990c).

GUATEMALA

From 1981 to 1989, USAID/Guatemala supported the Small Farm Diversification Systems (SFDS) (520-0255) project. The project was implemented by government agencies, including the Institute of Agricultural Science and Technology (ICTA), the Directorate General for Agricultural Services (DIGESA), the Directorate General for Livestock Services (DIGESEPE). SFDS contained the following research, extension, and education components:

Research: This component provided for ICTA and DIGESA to initiate a farm management survey to provide data to develop interdisciplinary farm models for small farm testing of the suitability of diversified crops (apples, peaches, cole crops, carrots, garlic, onions and potatoes) and livestock (sheep and dairy cows).

Extension: This component provided for training progressive farmers as "guias" (guides) and promoting diversified agriculture among future farmers through a 4-S Club Fund. A mix of extensionists, promoters, and "guias" were to be assigned to 10 pilot diversification districts of 480 farmers each; also, soil conservation and mini-riego teams (two each) were to operate in the region.

Education: Under this component, DIGESA and the Directorate General for Livestock Services (DIGESEPE) were to develop extension services at ICTA's Labor Ovalle station, where a Demonstration and Training Center, with a laboratory for plant and soil analysis, a crop data bank, and training classrooms were to be built. One hundred DIGESA (80) and cooperative (20) extensionists were to be trained at the center and in the field in such areas as crop management, disease/pest control, conservation, and crop handling/ storage. Eight ICTA and DIGESA/DIGESEPE personnel were to receive M.S.-level training in extension system management and agricultural research, and in-service training curriculum and materials were to be developed for ICTA, DIGESA, and DIGESEPE staff.

The 3/86 Project Evaluation Summary noted that the project evaluation had found that progress in applied research and technology adaptation had been slow.

> The project design assumed that ICTA...possessed enough technological information to initiate diversified farm programs involving vegetables, deciduous fruits, and livestock. In fact, ICTA has had little experience in this area and has been reluctant to provide production recommendations. Research also needs to be refocused from on-station to model farms. Training is on target, but curriculum packages have not yet been developed.

The 8/28/89 Project Evaluation Summary of the 10/30/87 final evaluation of the SFDS project reported that research units for livestock, vegetables, and fruits were established in ICTA, that DIGESA had increased its extension activities in fruit and vegetable production; and that DIGESEPE's veterinary program had been expanded to include animal production and reoriented toward livestock farm management. Project achievements were attained despite many design and implementation problems. Major design flaws included: lack of a marketing component; an emphasis on production targets before the necessary institutional capacity was created and research results were available for extension; the development of a new, complex approach to farming systems research/extension rather than employment of ICTA's established and well-known approach; conflicting sets of roles and responsibilities between the coordinating unit and the regional implementing agencies; and inadequately funded technology validation and testing activities.

Beginning in 1983, USAID/Guatemala launched the 10-year (1983-93) Highlands Agricultural Development (HADS) (520-0274) project, that is being implemented by four government agencies--DIGESA, the National Forestry Institute (INAFOR), the National Agricultural Development Bank (BANDESA), and the Department of Rural Roads (DCR). The project includes research, extension, and education components, as follows:

> Research: Under the 8/88 amendment (phase II), research and extension components were added, with new outputs: research laboratories and data banks to support crop diversification.
>
> Extension: DIGESA extensionists were to help farmers build small irrigation systems on 750 ha (thereby encouraging crop diversification) and complementary soil conservation structures--mainly bench terraces--on 5,000 ha.
>
> Education: Under this component, training is to be provided to community reforestation committees and INAFOR and DIGESA technicians. Under the 8/85 amendment, 4,400 farmers were to be trained in soil conservation and construction. Under the 8/88 amendment (phase II), extensive training and technical assistance were to be funded.

The 12/87 Project Evaluation Summary noted that the evaluation had found that extension agents had not been properly trained to educate farmers in construction and maintenance of the irrigation systems and had not provided sufficient follow-up extension activities. Further, the evaluation noted that a major lesson had been learned, namely, that a marketing component should be built into any production-oriented project, especially

> one which involves a heavy individual debt, such as mini-irrigation. Ideally, planning should start from the market linkages and work backward, in order to decide what crops to plant, when to plant, and in what quantity. Other lessons are: (1) there should be only one USAID project manager for any given project; and (2) the executing host country agency should have the capacity to, or be trained to, establish priorities, conduct (or contract for) baseline studies, and evaluate activities.

From 1986 to 1989, USAID/Guatemala provided support for the Aquaculture Extension (520-0351) project that was implemented by a PVO (CARE). The project included an education component that entailed CARE providing training in aquaculture and small animal production to 12 DIGESEPE extensionists, as well as to 34 aquaculture promoters and 34 small animal production promoters chosen from participating communities. These personnel, aided by PCVs, were to train some 650 farmers. Also, CARE was to form community producer associations as a vehicle for providing farmers with more effective training and other group benefits.

During the same period (1986-89), the Mission supported the Guatemala Dairy Development (520-0355) project implemented by the National Cooperative Business Association and Land O'Lakes. This project included research and extension components, as follows:

Research: Assessment of the dairy industry,including analysis of milk production, collection, processing, and marketing in the context of competition from imports of non-fat dry milk. Project was to determine potential demand for donated dairy commodities to be sold to finance other dairy assistance such as extension services and credit.

Extension: Provision of technical assistance and training to small farmers in dairy livestock management, nutrition and milk production, and to processors in milk handling, transportation, processing, and marketing.

From 1988 to 1991, the Mission is funding the Development Training and Support (520-0384) project, implemented by a PVO. The project includes an education component based on a three-tiered training methodology. In-country training is provided in a given subject area. The most successful during this phase are to receive U.S. or third-country training; on their return home, they are to become in-country trainers. Components included are: management and technical training, public sector policy and program analysis training, and a Merit Scholarship Program (5-year scholarships for 100 persons to a Guatemalan university). The Zamorano Scholarship Program provides partial (70%) scholarships to the Pan American Agricultural School in Honduras to 70 disadvantaged rural youth. The project also funds 24 M.A.'s and 10 Ph.D's for university faculty members.

Analysis

During the 1980s, USAID/Guatemala support for strengthening agricultural research, extension, and education in Guatemala was primarily directed at public institutions such as ICTA, DIGESA, and DIGESEPE. This support, initially provided in the Small Farm Diversification Systems project, was on the diversification of small farmer cropping systems. This initiative was supported by a mix of research, extension, and education activities. But the evaluation of SFDS found that progress in applied research and technology adaptation had been slow because the project design mistakenly assumed that ICTA possessed sufficient technological information to undertake a crop diversification program. But ICTA had little experience in this area and was reluctant to provide production recommendations.

A second major initiative during the 1980s was the Highlands Agricultural Development (HADS) project. This project, which also had a mix of research, extension, and education activities, was implemented by a mix of public sector agencies. However, the project's evaluation found that, once farmers had been provided assistance for the building of irrigation systems, extension agents did not provide adequate follow-up extension. Further, the evaluation found that HADS lacked an adequate marketing component.

Two projects having primarily extension and, in some cases, research components, and which were implemented by PVOs, were Aquaculture Extension (CARE) and Guatemala Dairy Development, implemented by the National Cooperative Business Association and Land O'Lakes, respectively. One project implemented by a PVO but which focused on agricultural education was Development Training and Support which was implemented by Partners in International Education and Training. This project also included support for (1)

the Zamorano Scholarship Program that provides partial (70%) scholarships for approximately 70 disadvantage rural youth to attend the Pan American Agricultural School in Honduras, and (2) for M.A. and Ph.d. training for university faculty members.

USAID/Guatemala interest in working with and through private organizations such as PVOs appears to be continuing. Indeed, by the late 1980s, the Mission had begun to explore the possibility of establishing a private sector foundation to provide leadership and funding support for the development of agricultural research and technology transfer on non-traditional agricultural export crops. This foundation, referred to in working documents, might be called "The Research and Technology Transfer Foundation" or the "Agricultural Research Foundation."

HONDURAS

From 1979 to 1989, USAID/Honduras provided support for the Rural Technologies (522-0157) project implemented by the Center for Industrial Development (CDI) of the Ministry of Economy. This project absorbed and expanded to a national scale activities begun under the Small Farmer Technology Project (522-0123). The project was designed to develop systems for testing and delivery of technologies to small farmers, entrepreneurs, and rural families. Based on input from these target groups, problems were to be identified and analyzed, followed by delivery of appropriate assistance or implements, relying to the maximum extent possible on existing Honduran businesses and organizations. The project included research, extension, and education components, as follows:

> Research: This component provided for field testing of farm technologies in small farmer systems.
>
> Extension: Under this component, technologies found to be promising in the field tests were to be produced for large-scale demonstration through a program worked out between the Ministry of Economy (MOE) and the CDI. Evaluations of all technologies were to follow on-farm demonstrations. The 7/84 project amendment increased emphasis on promoting adoption of proven technologies.
>
> Education: The results of evaluation were to be incorporated into training programs and information pamphlets for distribution to all small farmer information dissemination networks; further, the project was to provide training for farmers and entrepreneurs.

The 12/88 Final Evaluation of the project found that the most successful technologies were veterinary services, domestic stoves, soil and water conservation techniques, metal silos, corn shellers, and innovations in cropping systems and cultivars. Also, the evaluation noted that much of the project's impact from 1986 forward could be attributed to the project having adopted the farming systems approach in 1984.

From 1980 to 1989, USAID/Honduras supported the Natural Resources Management (NRM) (522-0168) project implemented by various government agencies. NRM included an

extension component comprised of an action program implemented in five sub-watersheds of the Choluteca watershed. Appropriate technologies were provided to area farmers, particularly traditional small subsistence farmers, to improve their socio-economic condition, protect the soil, and increase production. The project included activities in soil conservation and intensive agricultural practices; agro-forestry and fuelwood production; reforestation; range management and pasture improvement; and community nursery establishment.

The 6/86 Project Evaluation Summary reported that the project's efforts in conservation had been

> extremely successful. Half of the targeted 7,000 farm families are using improved hillside practices, increasing their grain yields by 100-400%. Income increases from diversification and agroforestry have also been significant. About 7,000 of a planned 18,000 ha have been protected through soil and water conservation structures, improved pastures, reforestation, and/or agroforestry activities.

Key lessons learned included: (1) neither land reform nor credit programs are needed in soil conservation efforts, if farmers can be shown the tangible benefits of improved practices; and (2) use of paratechnicians can broaden the reach of an extension program quickly and economically.

One of the Natural Resources Management project's sub-projects (01: Integrated Rural Development), initiated 8/86, provided support for implementation of an IRD program by the Partners of the Alliance (PAL), an indigenous NGO, in the Sabanagrande area of south central Honduras. This project provided support for upgrading extension by refining the core curriculum; training 30 new field technicians; providing supplemental training and technical assistance to project staff and participants; and field testing farm practices and crop varieties. Also, the project was to train 3,000 farmers in human resource motivation, soil building techniques, alternative crops, animal husbandry, and land use planning; expose 2,500 others to agricultural techniques introduced by the project; and expand integrated pest management.

Under agroforestry, the sub-project was to help participants evaluate and improve land use, demonstrate the multiple uses of trees, introduce fast-growing and disease-resistant tree varieties, and promote multi-purpose legumes, promote soil stabilization and water conservation practices (e.g., windbreaks, live barriers, shade trees, and use of selective reforestation), stimulate small agroforestry businesses by promoting the sale of fruit products and the use of ecologically sound commercial wood production and by improving pine refining techniques, and solve water catchment and distribution problems by evaluating water entrapment options, identifying the land characteristics most favorable for constructing hand dug wells, and promoting construction of higher well walls and well covers to protect water source from animal contamination and evaporation.

From 1989 to 1993, USAID/Honduras is providing support for the Land Use Productivity Enhancement (LUPE) (522-0292) project implemented by the Ministry of

Natural Resources and PVOs. The project includes the following extension and education components:

Extension: LUPE is being implemented through an extension framework based on 32 field units (developed under 518-0069). The project is to field 10 additional units a year and to help PVOs to form another 10 units. These Units are to introduce integrated pest control, crop diversification, mulching, and minimum tillage among 30,000 marginal farmers and 20,000 small commercial farmers, including 12,500 women farmers in environmentally-threatened hillsides in five key watershed areas of Honduras (Francisco Morazan, Choluteca, Valle, Yoro, Comayagua, Olancho, and El Paraiso Departments). The project includes community and on-farm nurseries (fruit trees and multipurpose trees), community gardens, hillside improvements (soil/water/forest management), animal husbandry (e.g., animal containment, cut and carry feeding, rotational grazing, health programs), groundcover improvements on pasture and rangeland, return of overgrazed land to farm/forest production, postharvest interventions (on-farm grain storage and sun drying of fruits and vegetables), and marketing (produce collection centers and improved sorting, packing, etc. technologies).

Education: This component is to train extensionists, paratechnicians, and contact farmers as well as provide funding for long-term U.S. and Honduran training of technical specialists and extension supervisors.

USAID/Honduras supported a number of projects having a focus on agricultural education. The first, from 1980 to 1983, was the Rural Pilot Schools Development (522-0170) project implemented by CARE and the Peace Corps in collaboration with the Ministry of Education. This project sought to provide agricultural assistance and an appropriate education to about 18,000 children in 25 pilot primary schools in rural Honduras. A project objective was to establish 150 self-sustaining production projects at the schools and ensure that 160 classes a day were conducted in agriculture. The 12/82 evaluation of the project noted: "Signs of the project's impact are emerging--children in 70% of the pilot schools are transferring knowledge to their homes, 67% of the schools have increased community contact in the form of labor and commodity project contributions, and 85% have received requests for community extension."

From 1981 to 1984, the Mission supported the S.O.S. Training of Migrant Youth (522-0189) project implemented by a PVO. This project assisted the Sociedad Amigos de Los Niños - Aldeas S.O.S. Farm Village - to expand and improve its educational, vocational, and agricultural training for abandoned and orphaned children in Honduras. Assistance was provided for expansion and improvement of training center facilities.

From 1982 to 1984, USAID/Honduras supported the Agricultural Education (522-0223) project implemented by the private University of San Pedro Sula (USPS). This project sought to strengthen the USPS Agricultural School and establish extension teaching and training programs. A University Extension Center was to meet demands for short courses on

alternative time schedules through a Friday/Saturday 2-year program; also, surveys were to assess the need for short-term seminars and workshops/

In 1989, the Mission provided a grant to the Pan American Agricultural School [Escuela Agrícola Panamericana (EAP)] (522-0362). The grant was made to provide publication funding, as well as bridge financing, to EAP's Integrated Pest Management (IPM) program. The grant was to fund research to combat a variety of maize, bean, cabbage, and sorghum pests. Additional research, training, and publication activities were to be supported in entomology, plant pathology, and weed science. Funds were to be used to help construct the EAP Biological Control Center, and to aid research and information dissemination at the school's Pesticide Use and Efficacy Center. Also, EAP's Diagnostic Center and Agroecological Inventory Center were to receive monies to develop biological field sample processing and a computerized database of organisms in the Honduran ecosystem. Thus, the project included research, extension, and education components.

By the mid-1980s, USAID/Honduras began to emphasize non-traditional agricultural export (NTAE) crops. As part of this NTAE initiative, the Mission provided a grant for the Agricultural Research Foundation (522-0249) project implemented by the private Honduran Agricultural Research Foundation (FHIA). This project, to be implemented, between 1984 and 1994, includes research and extension components, as follows:

> Research: FHIA is to conduct on-farm/on-station research to develop appropriate technologies to address productivity-limiting constraints on nontraditional (e.g., citrus, cocoa, and winter vegetables), traditional export crops (e.g., banana and plantain), and basic food crops.
>
> Extension: FHIA's Communications Unit is to improve technology dissemination by establishing links to national and international agricultural research centers and educational institutions; producers; processing, trade, and other private sector entities; the National Extension Service (and, to a limited extent, with farmers). The Communications Unit and the Ministry of Natural Resources are to co-establish a National Agricultural Communications Network to produce materials in various media; improve training of FHIA (mid- and lower-level), MNR, and private extensionists; and turn FHIA's library into a computerized research data and information service.

The 11/87 mid-term evaluation reported that FHIA

> lacks the resources to carry out research in crops of national (cacao, etc.) and international (banana, etc.) importance and at the same time investigate potential export crops (e.g., mango, black pepper, etc.). Original project funding and staffing levels were totally inadequate for the scope of effort required. It is estimated that another 10 years will be required to lay the groundwork for FHIA to sustain an impact on Honduras' agricultural economy.

Subsequently, the 6/88 Project Evaluation Summary reported that

> FHIA's original mandate was not only too broad, but also ill-suited for FHIA's evolving role and potential clientele, ...FHIA should redefine its mandate...to emphasize research on export crops, and develop a way to prioritize ongoing research and add or reassign positions to add depth to understaffed departments.

Analysis

During the 1980s, USAID/Honduras' projects having research, extension, and/or education components in the Mission's agriculture portfolio' tended to focus on (1) technology generation and transfer for small farm agriculture; (2) NTAE crop development; and (3) agricultural education.

In technology generation and transfer for small farm agriculture, Rural Technologies, implemented by the Center for Industrial Development, focused on technology generation and transfer for a mix of agricultural and rural problems. The final evaluation concluded that the project's success was due to having adopted a farming systems approach. The Natural Resources Management project, implemented by various government agencies, focused on transferring appropriate technologies to traditional small subsistence farmers in sub-watersheds of the Choluteca watershed. One of the project's sub-projects (Integrated Rural Development), implemented by an indigenous NGO (Partners of the Alliance), had an agroforestry component.

In NTAE crop development, support was provided through the creation of a private agricultural research organization, the Honduran Agricultural Research Foundation (FHIA). FHIA will continue receiving support under the Agricultural Research Foundation project until 1994; however, the Mission is currently working with FHIA to establish an endowment that would provide funding to support FHIA after the current project ends.

In agricultural education, the Mission provided support for agricultural education at several levels. The Rural Pilot Schools Development project, implemented by CARE, Peace Corps, and the Ministry of Education, focused on providing classes in agriculture in primary schools. Another PVO-implemented project, S.O.S. Training of Migrant Youth, assisted the Sociedad Amigos de Los Niños - Aldeas S.O.S. Farm Village - to expand and improve its educational, vocational, and agricultural training for abandoned and orphaned children. The Agricultural Education project, implemented by the private USPS, sought to strengthen that university's Agricultural School. In the late 1980s, the Mission's Pan American Agricultural School project provided funding for the school's IPM program. Generally, in projects involving public implementing agencies, funding has been aimed at supporting project implementation, not achieving institution building objectives. By comparison, the Agricultural Research Foundation project, implemented by FHIA, is an institution building project to develop FHIA as a self-sustaining technology generation and transfer organization.

ROCAP

From 1981 to 1990, ROCAP provided support for the Regional Coffee Pest Control (596-0090) project that was implemented by the Programa Cooperativa para la Protección y Modernización de la Caficultura en Mexico, Centroamérica y Panamá (PROMECAFE), funded through the Interamerican Institute for Cooperation on Agriculture (IICA). The project included research, extension, and education components, as follows:

Research: Under this component, PROMECAFE and the Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA) were to study the epidemiology of rust and the efficacy of fungicides under greenhouse and field conditions. OIRSA was to study biological and chemical means to control broca, using research data to develop training manuals for national-level personnel; also, OIRSA was to develop a system for analyzing pesticide residues and establishing standards for registering pesticides. CATIE (Tropical Agricultural Research and Training Center, Turrialba, Costa Rica) was to identify and reproduce new rust-resistant, high-yield, good quality varieties. On the basis of data generated by these research activities, appropriate technology packages were to be developed and tested in various countries.

Extension: Under this component, national- and regional-level project data were to be stored on IICA's computerized data base and used to develop regional information sets. The data base were also to be expanded to include other regional and global coffee research data for dissemination to national and regional personnel. The 8/87 amendment placed increased emphasis on region-wide dissemination of research results through radio education, group training, and publications for small coffee producers.

Education: Under this component, training manuals and short courses were to be developed for national-level technicians. Seminars were to be provided to national groups concerning the standardization of regulations and registration of pesticides. During the course of the project, 12 national and regional technicians were to be trained in resistance evaluation, and regional specialists were to provide on-the-job training to 50 national technicians and conduct 15 short courses. The 8/87 amendment placed increased emphasis on pest control training for researchers and national-level extension agents.

From 1987 to 1990, ROCAP provided support for the Regional Agricultural Technology Networks (596-0127) project implemented by the Inter-American Institute for Agricultural Cooperation (IICA) in cooperation with CATIE and the Honduran Foundation for Agricultural Research (FHIA). The project included research, extension, and education components, as follows:

Research: Under this component, the project was to increase the production of cacao in Central America and Panama by establishing a regional cacao technology development and transfer network. A network management component was to provide a mechanism for communication and effective regional collaboration on

research and extension through joint programming of research and training activities, meetings and conferences, exchange of information, site visits, and interinstitutional coordination. This effort was to be under the direction of the IICA; also, there was to be an Executive Committee composed of representatives of CATIE, FHIA (Honduran Agricultural Research Foundation, La Lima), ROCAP, and national research and extension institutions and an Advisory Committee that also would include private sector processing companies and other organizations in the cacao industry.

Research was to focus on three general areas: (1) the epidemiology and control of three major cacao diseases (Monilia Pod Rot, Blackpod, and Mal de Machete); (2) production and testing of high-yield, disease-tolerant varieties (outputs include, inter alia, at least 30 crosses with potential resistance to two major diseases and the annual production of 200,000 hybrid seeds by national clonal gardens for sale to farmers; and (3) improved cultural practices, e.g., through research on planting configurations, shade and plant nutrition relationships, the effect of ecology on cacao yields, replanting, and interplanting. The first two activities were to be principally carried out by CATIE and the third by FHIA.

Extension: Under this component, a technology transfer and training component was to design and field test in Honduras a prototype technology transfer strategy and communication package for and in concert with cacao farmers.

Education: Under this component, the technology transfer and training component also was to improve the capacity of national research and extension personnel through classroom training and field work at CATIE, FHIA, and other area institutions, with emphasis on short courses for researchers, extensionists, and cacao producers.

From 1981 to 1990, ROCAP provided support for the Fuelwood and Alternative Energy Sources (596-0089) project. Subproject 01, Improved Means of Fuelwood Production, was implemented by CATIE and national counterpart agencies. The project included research, extension, and education components.

Research: Under this component, CATIE and national counterpart agencies were to identify fast-growing tree species. The 15 most suitable species were to be subjected to various management practices to determine which of the latter will maximize production. CATIE was to hold five research seminars.

Extension: Under this component, CATIE was to publicize this information annually, in addition to recommendations and technical reports. CATIE was to set up in-country demonstration plots in varying ecological situations.

Education: Under this component, CATIE was to provide five, two-week intensive training courses at CATIE for 75 national counterpart officials; and to conduct five in-country training sessions for 100 individuals in all phases of fuelwood production.

Also, 18 Central Americans were to be trained to the M.Sc.-level, nine at CATIE and nine in the U.S.

The 7/86 Final Report for the project noted: "...field demonstrations, and training of national staff should continue, and more emphasis should be placed on extension of existing and new technical packages to agents and farmers."

Between 1985 and 1991, ROCAP is providing support for the Tree Crop Production (596-0117) project being implemented by CATIE. This project, a follow-on to 596-0089 (Fuelwood and Alternative Energy Sources), includes research, extension, and education components, as follows:

Research: Under this component, research is to take place on small privately-owned holdings and include study of multi-use trees in short rotation forestry. The project is to standardize trial establishment and data collection methodologies; expand the network of research sites, quantify guidelines for predicting yields, and develop high quality germplasm. Applied socioeconomic research is to help influence farmers to plant tree crops by gathering data on and evaluating demand for wood products, market and non-market benefits, production costs, wood lot trade operations, and incentives.

Extension: Under this component, CATIE is to establish demonstration sites, grouped in clusters, to show the uses and income potential of integrating tree crop technologies onto small and medium farms; organize visits to the clusters; and provide assistance to extension agencies. CATIE is to organize short orientation sessions and visits to demonstration sites for top and mid-level officials; sponsor at least one conference per country; and develop simple, practical instructional guidelines, educational materials, and audiovisual presentations (on silvacultural and socioeconomic aspects of tree crops) for extension agents. The project is to expand tree crop library collections at CATIE and other institutions; develop field manuals, technical publications, and a management information system; and provide specialized technical assistance to national institutions.

Education: Under this component, the project is to develop a critical mass of technical field personnel with specialization in tree crop applications; train professionals in tree crop research methods; and fully train and utilize forestry extension agents. CATIE is to increase the number of graduate students and courses in its programs, provide financial support for at least 22 students (for thesis research and M.Sc. degrees), and provide on-the- job training and short courses. At least three other institutions in the region are to be selected for faculty upgrading (to gradually transfer the training focus to national institutions), and specialized training materials are to be developed.

From 1984 to 1989, ROCAP provided support for the Integrated Pest Management (596-0110) project that was implemented by CATIE. The project included research, extension, and education components, as follows:

Research: Under this component, CATIE was to conduct small farm-related IPM research. Both fundamental and applied research were to be carried out on-farm (100 tests) and at experimental stations. On-farm research was to begin with small-scale testing of unproven IPM systems and proceed to large-scale testing of those that show promise. Research was to include a comprehensive evaluation of the crop pest complex for biological, socioeconomic, and environmental variables, as well as special efforts to incorporate chemical pesticides into IPM programs. Socioeconomic research was to be conducted to measure the acceptability of project-tested IPM techniques. A workshop in the project's fourth year was to study research results. Research was to be strengthened via linkages with national institutions in the region.

Extension: Under this component, CATIE was to develop capacity to provide technical services. Establishment of a capacity within CATIE to provide IPM services to public and private institutions and individuals was to include: (1) a regional pest diagnostic service center, along with similar centers in each project country; and (2) a regional IPM Information Service Center to develop a computerized IPM information base, provide information search and referral and low-cost photocopy services and library loans, publish and distribute a quarterly IPM newsletter, and offer related training and technical assistance.

Education: Under this component, CATIE was to provide IPM training that would include: a special seminar on recent IPM developments for project personnel and 13 short-term seminars and 29 workshops, for 140 and 750 persons, respectively; final country seminars, each attended by 200; U.S. Ph.D. and nondegree training, for 4 and 15 respectively; M.S. training at CATIE for 15 and study tours for 11 technicians. Some 25 training modules on IPM principles, methodology, and practices, were to be developed.

From 1985 to 1991, ROCAP is providing support for the Regional Agricultural Higher Education (596-0129) project. This project is providing funding support for the development of programs at the Agricultural School for the Rural Humid Tropics (EARTH) and at Tropical Agricultural Research and Education Center (CATIE).

EARTH is patterned after the "learning-by-doing" approach of the Pan American Agricultural School (EAP) in Honduras. EARTH was established in Costa Rica as a 4-year, undergraduate school with primary focus on practical training in lowland humid agriculture. The school is developing a B.Sc. curriculum providing equal time for classroom instruction and practical applications. EARTH was expected to open in 1/87 and to train 400 undergraduates and grant 100 B.Sc. degrees annually. However, the school did not open until March 1990.

Faculty and administrative personnel (including a fundraiser) for EARTH were to be recruited by a U.S. university. Also, the U.S. university is to provide special training for faculty upgrading. Construction of the school's physical facilities--an administrative building, classrooms and laboratories, animal and crop production units, faculty and student

housing, and recreation and maintenance facilities--was to take place over the first 5 of the project's 10 years.

CATIE, under this project, is to expand its graduate and nongraduate programs by adding 16 teaching faculty positions (7 in animal production, 5 in plant production, 3 in renewable natural resources, and 1 in computer center). Facility upgrading is to include building faculty and student housing and graduate education and computer centers, restoring the La Lola Experimental Station, replacing water and electrical systems, and providing vehicles and laboratory/research equipment.

CATIE's new Graduate Studies and Training Department is to expand its 2-year degree program to 60 M.Sc. graduates annually. Participants in short courses, seminars, and inservi e training are to number approximately 3,500. Technical assistance is to be provided for staffing, fundraising, library materials, and curriculum development.

Development of professional and operational links between EARTH and CATIE and between both and other national and international agricultural institutions is to be a project priority.

Analysis

ROCAP-funded projects involving research, extension, and/or education components have had a regional focus, with implementation carried out by regional organizations, primarily CATIE and IICA. Several generalizations can be made:

1. Projects typically have focused on traditional export crops and/or problems common to several countries in the Central America region [e.g., coffee, cacao, fuelwood (tree crop) production, and integrated pest management (IPM)].

2. Crop-specific and problem-focused projects have tended to include all three functions--research, extension, and education.

   a. Research: Project support has emphasized use of research networks.

   b. Extension: Project support has emphasized appropriate means (from demonstrations to printed materials) to disseminate improved technologies and related research information.

   c. Education: Project support has emphasized a mix of field training, short courses, seminars, and degree training.

3. Higher agricultural education is one of the major areas of ROCAP funding support. CATIE receives a major portion of its budget, both project-specific and core, from Regional Agricultural Higher Education. EARTH (Agricultural School for the Rural Humid Tropics) was totally funded by ROCAP. The Pan American Agricultural School (EAP) in Honduras also receives ROCAP funding.

4. While country-specific Missions have implemented projects through either public or private agencies, ROCAP-funded projects have, as a function of the Mission's regional approach, tended to work with public rather than private organizations.

Annex C. LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs

DATE: 7/20/90
TO: LAC Mission ADOs
FROM: Mike Korin, Acting Chief, LAC/DR/RD
SUBJECT: LAC/DR/RD SURVEY OF LAC MISSION AGRICULTURAL RESEARCH, EXTENSION, AND EDUCATION PROJECTS/PROGRAMS

LAC/DR/RD is conducting a review of agricultural research, extension, and education in the LAC region. The review will assist LAC/DR/RD in identifying the key trends and problems in agricultural technology generation and transfer as well as current and/or planned Mission projects and strategies to address these problems. The review also will be used in developing the upcoming LAC Agriculture & Natural Resources Strategy. In addition, it will assist LAC TECH in developing FY91 work plans tailored to Mission ARD technical support needs in agricultural research, extension, and/or education. As part of the review, we are conducting a survey to obtain data on LAC Mission portfolios containing agricultural research, extension, and/or education projects/programs or activities in these areas. Therefore, we have developed a questionnaire for LAC Missions which is an integral part of the review.

Each Mission's support of this survey is essential to ensure a systematic and objective review of Mission portfolios as these relate to agricultural research, extension, and education. LAC/DR/RD recognizes that Mission ARD staff are busy and wishes to avoid having your staff spending unnecessary time in replying to the survey. Therefore, we have tried to design the questionnaire in a way that will expedite its completion by your staff.

LAC Mission funding for agricultural research, extension, and education, as a percent of total A.I.D. funding for agriculture and natural resources/environment, significantly fell during the 1980s. This would not be of any great concern if the evidence also indicated that A.I.D.-assisted countries had developed a self-sustaining capacity to generate and transfer productivity-increasing agricultural technologies. But declining per capita food production, rising cereal imports, and increased interest in non-traditional agricultural export crops in the LAC region point to a need to reassess A.I.D.'s portfolio in the agricultural research, extension, and education areas.

Please return the completed questionnaire by August 15, 1990 to LAC/DR/RD by the most expeditious means (hand carry, courier such as DHL, FAX, or pouch). If hand carried or pouched, send to LAC/DR/RD (attention: Mike Korin). If returned by courier (DHL), please send directly to LAC TECH at Chemonics International, 2000 M. St. N.W., Suite 200, Washington, DC 20036. If returned by FAX, please send to Kerry Byrnes @ FAX# (202) 331-8202. [TEL# (202) 466-0649] If there are any questions about the survey, please contact LAC/DR/RD's Mike Korin at (202) 647-5685.

Thank you for your cooperation and assistance in providing the requested information. A copy of the survey analysis and overall inventory will be sent to each Mission in late 1990.

LAC/DR/RD SURVEY QUESTIONNAIRE OF LAC MISSION
AGRICULTURAL RESEARCH, EXTENSION, AND EDUCATION
PROJECTS / PROGRAMS

Instructions:

1. If at all possible, please draft your answers to the questionnaire items on a copy of the questionnaire and then have your secretary typ your answers on a clean copy of the questionnaire.

2. It may be appropriate or most useful to have several Mission staff persons work as a group to complete the questionnaire; in either case please indicate, in the appropriate space(s) below, who was (were) th person (or persons) completing the questionnaire.

   Name & Job Title: _____

   Name & Job Title: _____

   Name & Job Title: _____

3. If any of your replies should be treated as confidential, not to be quoted in reporting the results of this survey, please bracket and asterisk ("*[ ]") such replies.

4. For this survey, the term "agricultural research, extension, and education program" includes current and planned Mission projects having components aimed at assisting public and/or private sector organizations to improve agricultural technology generation, transfer and/or education in the Mission's host country or region (for ROCAP and RDO/C).

5. Please return the completed questionnaire by August 15, 1990 by the most expeditious means available: hand carry, courier such as DHL, FAX, or pouch. If hand carried or pouched, please send to LAC/DR/RD (attention: Mike Korin). If returned by courier (DHL), please send directly to:

   Kerry J. Byrnes
   LAC TECH
   Chemonics International
   2000 M. St. N.W., Suite 200
   Washington, DC 20036.

   If returned by FAX, please send to:

   Kerry J. Byrnes @ FAX# (202) 331-8202. [TEL# (202) 466-0649]

6. If there are any questions about this survey, please contact LAC/DR/RD's Mike Korin at (202) 647-5685. Inquiries about any questionnaire item should be directed to Kerry Byrnes.

7. If, in answering a question, you would like LAC TECH to refer to a document available only in the Mission, please pouch a copy of the document to: LAC/DR/RD (attention: Mike Korin & LAC TECH KJB).

8. Thank you for your cooperation and assistance in providing the requested information.

1. The following is a list of what AID/W records indicate to be your Mission's current or planned projects (by project number and title) with components aimed at improving agricultural research, extension, and/or education in the public or private sectors. (Note: The terms "research" and "extension" are understood to include "technology development, adaptation, and transfer.")

Please indicate the project start and end dates (month/year), the implementing agency, whether public or private sector, and the technical assistance (TA) contractor (if any).

Please indicate any project that should be deleted from or added to the list.

Number:
Title:
Month/Year: Start: _____ End: _____
Implementing Agency: _____
Public or Private? Circle one: Public Private Both
TA Contractor: _____

Number:
Title:
Month/Year: Start: _____ End: _____
Implementing Agency: _____
Public or Private? Circle one: Public Private Both
TA Contractor: _____

Number:
Title:
Month/Year: Start: _____ End: _____
Implementing Agency: _____
Public or Private? Circle one: Public Private Both
TA Contractor: _____

Number:
Title:
Month/Year: Start: _____ End: _____
Implementing Agency: _____
Public or Private? Circle one: Public Private Both
TA Contractor: _____

Number:
Title:
Month/Year: Start: _____ End: _____
Implementing Agency: _____
Public or Private? Circle one: Public Private Both
TA Contractor: _____

2. For each current project listed in #1 that has a monitoring and evaluation (M&E) plan developed by the project's implementing agency and/or technical assistance contractor, please pouch a copy of the plan to LAC/DR/RD (attention: Mike Korin & LAC TECH KJB). (This will provide LAC TECH with data essential for reviewing how Missions are addressing the problem of monitoring impact of assistance at a project's purpose and goal levels.)

3. What is the Mission's current position with respect to using non-project assistance (i.e., policy dialogue coupled with ESF- and/or PL480-generated local currency) to stimulate change in:

(a) Public sector resources allocated to agricultural research, extension, and education institutions?

___ Mission does not have a position on this issue.

___ Mission's position with respect to this issue is as follows (please summarize Mission's position):

(b) Governmental policies and programs relating to agricultural research, extension, and education institutions?

___ Mission does not have a position on this issue.

___ Mission's position with respect to this issue is as follows (please summarize Mission's position):

The following series of questions (#4-#7) is designed to provide an opportunity for the Mission to assess the progress made during the past decade (1980s) in strengthening agricultural research, extension, and/or education institutions in the Mission's host country.

Questions #4-#7 are divided into four question areas, as follows:

Area A: Improving Agricultural Technology Generation in **Public** Agricultural Research Organizations

Area B: Improving Agricultural Technology Transfer through **Public** Agricultural Extension Organizations

Area C: Improving Agricultural Education in Agricultural Education Organizations

Area D: Improving Agricultural Technology Generation & Transfer through **Private** Organizations

Within each area, specific criteria are listed against which the Mission's host country may (or may not) have made progress. For each criterion, please assign one of the following ratings:

5 = Much progress
3 = Some progress
1 = No progress
0 = Host country did not seek to make progress in Area

(Please Begin on the Following Page)

Area A: Improving Agricultural Technology Generation in Public Agricultural Research Organizations

4. Progress of **PUBLIC** AGRICULTURAL RESEARCH ORGANIZATIONS in:

5 = Much progress
3 = Some progress
1 = No progress
0 = Host country did not seek to make progress in Area A.

(a) ___ Getting the private sector involved in identifying agricultural research problems and setting research priorities.

(b) ___ Mobilizing support for agricultural research from the public sector (i.e., government funding).

(c) ___ Mobilizing support for agricultural research from the private sector (i.e., private funding).

(d) ___ Improving the internal organization and management of public sector agricultural research organizations.

(e) ___ Improving the quality of the scientific and support staff of public sector agricultural research organizations.

(f) ___ Obtaining technology (e.g., germplasm) from regional and international agricultural research organizations.

(g) ___ Participating in national and regional research networks.

(h) ___ Participating in Collaborative Research Support Programs (CRSPs).

(i) ___ Developing a program of on-farm trials as an integral part of an adaptive research program.

(j-p) Adapting technology to meet farmer growing conditions and income requirements from the production of (please respond in terms of the general category, since appropriate examples for each category may vary by country):

(j) ___ Staple food crops (e.g., corn, wheat, beans)
(k) ___ Livestock (e.g., cattle, goats, poultry)
(l) ___ Traditional export crops (e.g., coffee, banana)
(m) ___ Import substitution crops (e.g., onions, tomatoes)
(n) ___ Non-Traditional export crops (e.g., melons, berries)
(o) ___ Trees (e.g., farm forestry or agro-forestry)
(p) ___ Fisheries/Aquaculture (e.g., tilapia, shrimp)

(q) ___ Collaborating with agricultural extension organizations.

(r) ___ Collaborating with agricultural education organizations.

Area B: Improving Agricultural Technology Transfer through Public Agricultural Extension Organizations

5. Progress of PUBLIC AGRICULTURAL EXTENSION ORGANIZATIONS in:

5 = Much progress
3 = Some progress
1 = No progress
0 = Host country did not seek to make progress in Area B.

(a) ___ Establishing a clear purpose statement--what organization does, who it serves, how it operates, how financed, and how evaluated.

(b) ___ Providing agricultural research system with information on existing farming systems, farmer problems, and performance of present and new technology under farm-level conditions.

(c) ___ Identifying and making use of indigenous knowledge of farmers.

(d) ___ Drawing upon research-based technologies (varieties, practices) to extend technology tested as appropriate for specific site and farmer circumstances.

(e) ___ Maintaining a client-oriented approach, with emphasis on farmer participation in planning, execution, and evaluation, including involving all farm family members in culturally acceptable ways.

(f) ___ Locating offices and providing staff transportation to facilitate ready two-way access between farmers and extension workers.

(g) ___ Working with and through groups and community leaders to achieve efficiency and to accelerate spread of recommended technology.

(h) ___ Employing extension workers close in social distance to clients, and increasing their communication and organizational skills.

(i) ___ Making extension workers competent in technical subjects and diagnostic skills under farm and field conditions.

(j) ___ Improving extension workers' skills to conduct on-farm trials.

(k) ___ Establishing effective working links with all relevant parties--marketing agents, input suppliers, researchers, education, etc.

(l) ___ Using a variety of methods for communication and instruction, selected on the basis of audience, objectives, and circumstances

(m) ___ Maximizing use of mass media to generate interest, provide timely information, and recognize successful performances.

(n) ___ Monitoring adoption of recommended practices, adapting these as necessary to facilitate incremental adoption by farmers.

(o) ___ Providing systematic followup and follow through with farmers who adopt new technology to identify and solve unanticipated problems and facilitate adaptations in practices.

(p) ___ Being responsive to new problems arising from use of new technology, such as storage, utilization, and marketing.

Area C: Improving Agricultural Education in Agricultural Education Organizations

6. Progress of AGRICULTURAL EDUCATION ORGANIZATIONS in:

5 = Much progress
3 = Some progress
1 = No progress
0 = Host country did not seek to make progress in Area C.

(a) ___ Identifying the projected manpower requirements in the agricultural sector.

(b) ___ Developing or modifying agricultural education curricula to address identified manpower requirements.

(c) ___ Developing experiential ("learning by doing") approaches and incorporating these into the educational curricula.

(d) ___ Shifting from an emphasis on dispensing facts to passive students to an emphasis on problem-solving and development of learning, research, and management competencies.

(e) ___ Developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation.

(f) ___ Developing strategic planning (envisaging and programming for the needs of the future) as a management tool.

(g) ___ Developing the flexibility for university staff to allocate and share time according to problems faced by the agricultural sector rather than the disciplines in which staff members were trained.

(h) ___ Getting teaching staff involved in carrying out research on problems facing the agricultural sector.

(i) ___ Developing training programs in agricultural research management and organization.

(j) ___ Collaborating with agricultural research organizations.

(k) ___ Developing non-degree short courses to meet identified training needs of various audiences in the agricultural sector.

(l) ___ Collaborating with agricultural extension organizations.

(m) ___ Analyzing how the educational system, from primary and secondary levels through graduate/post-graduate education, is responding to the country's agricultural manpower requirements.

(n) ___ Developing a diversified mix of funding by private, public, and international sources.

(o) ___ Developing the university's links with worldwide sources of agricultural knowledge.

(p) ___ Providing up-to-date text books and learning materials in the country's principal language of instruction.

Area D: Improving Agricultural Technology Generation and Transfer throug Private Organizations

7. Progress of **PRIVATE** ORGANIZATIONS in:

5 = Much progress
3 = Some progress
1 = No progress
0 = Host country did not seek to make progress in Area D.

(a) ___ Getting the private sector involved in identifying researcl problems and setting research priorities.

(b) ___ Mobilizing research support from the public sector (i.e., government funding).

(c) ___ Mobilizing research support from the private sector (i.e., private funding).

(d) ___ Improving the internal organization and management of private sector research organizations.

(e) ___ Improving the quality of the scientific and support staff c private sector research organizations.

(f) ___ Obtaining technology (e.g., germplasm) from appropriate regional or international sources.

(g) ___ Participating in national and regional research networks.

(h) ___ Participating in Collaborative Research Support Programs (CRSPs).

(i) ___ Developing a program of on-farm trials as an integral part of an adaptive research program.

(j-p) Adapting technology to meet farmer growing conditions and income requirements from the production of (please respond in terms of the general category, since appropriate examplc for each category may vary by country):

(j) ___ Staple food crops (e.g., corn, wheat, beans)
(k) ___ Livestock (e.g., cattle, goats, poultry)
(l) ___ Traditional export crops (e.g., coffee, banana)
(m) ___ Import substitution crops (e.g., onions, tomatoes)
(n) ___ Non-Traditional export crops (e.g., melons, berries)
(o) ___ Trees (e.g., farm forestry or agro-forestry)
(p) ___ Fisheries/Aquaculture (e.g., tilapia, shrimp)

(q) ___ Strengthening collaboration with agricultural extension organizations.

(r) ___ Strengthening collaboration with agricultural education organizations.

8. Circle the number best describing each item's status in the public sector organization primarily responsible for agricultural research.

PUBLIC SECTOR ORGANIZATION PRIMARILY RESPONSIBLE FOR **AGRICULTURAL RESEARCH**	VERY GOOD 9	GOOD 7	AVG 5	POOR 3	VERY POOR 1
a. **ADEQUACY OF BUDGET:**	9	7	5	3	1
b. Budget Available on Timely Basis	9	7	5	3	1
For Salaries of:	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
c. Urban-based Technical Personnel	9	7	5	3	1
d. Field-based Technical Personnel	9	7	5	3	1
e. Administrators	9	7	5	3	1
f. For Per Diem	9	7	5	3	1
g. For Equipment/Supplies	9	7	5	3	1
ADEQUATE #s OF TRAINED:	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
h. Technical-Ph.D.-level	9	7	5	3	1
i. Technical-M.Sc.-level	9	7	5	3	1
j. Technical-Ingeniero Agronomo (or B.Sc. equivalent)	9	7	5	3	1
k. Perito Agronomo (or 2-year vocational school equivalent)	9	7	5	3	1
l. Administrative Personnel:	9	7	5	3	1
ADEQUACY OF SYSTEMS FOR:	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
m. Personnel Recruitment	9	7	5	3	1
n. Personnel Evaluation	9	7	5	3	1
o. Personnel Development	9	7	5	3	1
p. Merit Promotion	9	7	5	3	1
q. Program Planning	9	7	5	3	1
r. Program Budgeting	9	7	5	3	1
s. Program Monitoring	9	7	5	3	1
t. Program Evaluation	9	7	5	3	1

9. Circle the number best describing each item's status in the public sector organization primarily responsible for agricultural extension

PUBLIC SECTOR ORGANIZATION PRIMARILY RESPONSIBLE FOR **AGRICULTURAL EXTENSION**	VERY GOOD 9	GOOD 7	AVG 5	POOR 3	VERY POOR 1
a. **ADEQUACY OF BUDGET:**	9	7	5	3	1
b. Budget Available on Timely Basis	9	7	5	3	1
For Salaries of:	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
c. Urban-based Technical Personnel	9	7	5	3	1
d. Field-based Technical Personnel	9	7	5	3	1
e. Administrators	9	7	5	3	1
f. For Per Diem	9	7	5	3	1
g. For Equipment/Supplies	9	7	5	3	1
ADEQUATE #s OF TRAINED:	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
h. Technical-Ph.D.-level	9	7	5	3	1
i. Technical-M.Sc.-level	9	7	5	3	1
j. Technical-Ingeniero Agronomo (or B.Sc. equivalent)	9	7	5	3	1
k. Perito Agronomo (or 2-year vocational school equivalent)	9	7	5	3	1
l. Administrative Personnel:	9	7	5	3	1
ADEQUACY OF SYSTEMS FOR:	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
m. Personnel Recruitment	9	7	5	3	1
n. Personnel Evaluation	9	7	5	3	1
o. Personnel Development	9	7	5	3	1
p. Merit Promotion	9	7	5	3	1
q. Program Planning	9	7	5	3	1
r. Program Budgeting	9	7	5	3	1
s. Program Monitoring	9	7	5	3	1
t. Program Evaluation	9	7	5	3	1
u. % Farmers Reached by Extension	9	7	5	3	1
v. Quality of Extension Advise	9	7	5	3	1
w. How Farmers Rate Extension	9	7	5	3	1

FOR ITEMS #10 TO #13, CIRCLE THE RESPONSE (a, b, c, or d) THAT BEST COMPLETES THE STATEMENT; THEN SUMMARIZE THE MISSION'S RATIONALE FOR THE ACTION INDICATED BY THE SELECTED RESPONSE.

10. During the 1980s, the Mission _____ project funding to improve technology generation in **public** agricultural research organizations.

    a. increased
    b. reduced
    c. terminated
    d. did not allocate any

    Please summarize Mission's rationale for the indicated action:

11. During the 1980s, the Mission _____ project funding to improve technology transfer via **public** agricultural extension organizations.

    a. increased
    b. reduced
    c. terminated
    d. did not allocate any

    Please summarize Mission's rationale for the indicated action:

12. During the 1980s, the Mission _____ project funding to improve agricultural education in agricultural **education** organizations.

    a. increased
    b. reduced
    c. terminated
    d. did not allocate any

    Please summarize Mission's rationale for the indicated action:

13. During the 1980s, the Mission _____ project funding to improve agricultural technology generation and transfer through **private** organizations.

    a. increased
    b. reduced
    c. terminated
    d. did not allocate any

    Please summarize Mission's rationale for the indicated action:

FOR QUESTIONS #14-#16, PLEASE INDICATE, BY PROJECT NUMBER, WHICH CURRENT PROJECTS FROM QUESTION #1, IF ANY, ARE AIMED AT IMPROVING THE QUESTION'S INDICATED ACTIVITY. ALSO, PLEASE CIRCLE NUMBER (FROM THE SCALE BELOW) THAT BEST DESCRIBES THE PROGRESS EACH PROJECT HAS MADE IN THAT ACTIVITY.

0 = Too early in project for any progress to have been made
1 = None (no progress)
3 = Some progress
5 = Much progress
9 = Not relevant (no project was aimed at this objective)

14. Technology generation in PUBLIC agricultural RESEARCH organizations. Please indicate the relevant project numbers below (ditto for #13-15).

	Progress				
	Too Early	None	Some	Much	Not Relevant
#_____	0	1	3	5	
#_____	0	1	3	5	
#_____	0	1	3	5	

If you list no projects, then circle "9" at the right: 9

15. Technology transfer via PUBLIC agricultural EXTENSION organizations.

#_____	0	1	3	5	
#_____	0	1	3	5	
#_____	0	1	3	5	

If you list no projects, then circle "9" at the right: 9

16. Agricultural education in agricultural EDUCATION organizations.

#_____	0	1	3	5	
#_____	0	1	3	5	
#_____	0	1	3	5	

If you list no projects, then circle "9" at the right: 9

17. Technology generation and transfer through PRIVATE organizations.

#_____	0	1	3	5	
#_____	0	1	3	5	
#_____	0	1	3	5	

If you list no projects, then circle "9" at the right: 9

18. Listed below are potential constraints to improving agricultural research, extension, and education in a developing country when these functions are the responsibility of public sector organizations. Based on the situation in your host country, please assign one of the following ratings to each potential constraint:

3 = Major constraint
2 = Somewhat a constraint
1 = Not a constraint
0 = Host country is not seeking to improve public sector performance of these functions

Constraints Internal to Public Sector Organization:

(a) __ Host country is too small to support a public sector agricultural research, extension, and education effort.

(b) __ Public agricultural organizations are weak and the problems of reforming them are too difficult to solve.

(c) __ The country's government is unwilling to provide the funding required to cover the recurrent costs of field-level programs (e.g., farm-level trials).

(d) __ Country lacks qualified human resources to carry out a sustained program to develop public sector agricultural research, extension, and education organizations.

(e) __ The country's government fails to see any benefit in investing more heavily in agricultural research, extension, or education.

(f) __ There is a lack of demand for productivity-increasing technologies.

Constraints Internal to USAID Country Mission:

(a) __ In spite of a general commitment to long-term institution-building, there is an operational push toward short-term projects having highly visible, relatively immediate impact.

(b) __ A.I.D. now emphasizes the private sector, rather than the public sector, as the principal means of development.

(c) __ A.I.D. now encourages an export-led agricultural development strategy, rather than a food security strategy.

(d) __ In spite of a recognized need for production-oriented sustainable agriculture, there is an operational push toward conservation-oriented natural resource management projects.

(e) __ Mission strategy sees research, extension, and education separately rather than collectively (i.e., as being interrelated).

(f) __ Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.

(g) __ Mission does not have adequate staffing to deal effectively with agricultural research, extension, and/or education projects.

19. In light of the host country's achievements during the past decade (as identified in #4-#7) and existing constraints (as identified in #8, #9 and #18) to improving agricultural research, extension, and education, what does the Mission see as the priority issues relative to improving agricultural research, extension, and education in the host county?

20. Given these priority issues, what is the Mission's strategy/plans for improving agricultural research, extension, and education in the host country?

21. The Mission's strategy/plan is to identify, develop, and implement projects involving (circle appropriate response below):

    (a) ___ All 3 functions (RES, EXT, & EDU)

    (b) ___ Only 2 functions--please circle which two: RES EXT EDU

    (c) ___ Only 1 function--please circle which one: RES EXT EDU

    (d) ___ None of these three functions

22. What is the rationale underlying the Mission's strategy as outlined in your responses to questions #20-#21?

23. Please list below the most important management (operational) questions the Mission is facing with respect to agricultural research, extension, and education? (Examples: "Should the Mission terminate, reduce, or increase its support for public sector agricultural research?" "Should the Mission seek to improve research on non-traditional export crops, staple food crops, or a combination of these?" "Should the Mission initiate, increase, or reduce funding support for private agricultural research?")

24. Of the management (operational) questions listed in response to question #23, which questions does your Mission feel are most crucial in terms of needing study (analysis), strategy development, and/or project-related action (i.e., development of Scopes of Work for PIDs, PPs, or evaluations)?

25. What are the most promising opportunities for projects or possibly non-project assistance to facilitate improved agricultural research, extension, and education in the host country; which of these should be pursued by A.I.D. and which by other donors?

    a. Opportunities that should be pursued by A.I.D.?

    b. Opportunities that should be pursued by other donors?

26. Several Missions (e.g., Bolivia, Honduras), in response to a LAC/CDIE query, have expressed interest in developing or have begun to develop program-level performance monitoring system that would provide the Mission with improved capability (a) to track the impact of development assistance at the program level, and (b) to report on program impact to AID/W. A Mission's ARD program includes a portfolio of projects that, taken together, aim at some common goals. In the case of a Mission's ARD portfolio, these goals likely include:

a. Increasing the income of the poor majority;
b. Expanding the availability and consumption of food; and
c. Maintaining and enhancing the natural resource base.

Individual Missions may have more specific versions of these goals and/or other goals based on the particular problems and needs of the host country.

a. What are the goals of your Mission's ARD portfolio?

b. Does the ARD Office have an ARD program-level M&E plan?

__ No
__ Yes: If yes, please forward a copy.

c. With respect to a general category of Mission projects aimed at strengthening agricultural research, extension, and/or education, are any Mission projects, that would fall under this category, generating data to meet the information requirements of an existing ARD program-level M&E plan?

__ Mission does not have any projects in this category

__ Mission has projects in this category but does not have a program-level M&E plan

__ Mission has projects in this category and a program-level M&E plan but projects are not generating data to meet plan's information requirements

__ Mission has projects in this category, a program-level M&E plan, and projects are generating data to meet plan's information requirements

d. (see following page)

d. Describe the steps your Mission's ARD Office has taken to develop a M&E system to track performance of the Mission's project portfolio vis-a-vis the aforementioned ARD goals or the agriculture-related goals required in your country situation?

27. Use the space below to add any comments. If comments are specific to one of the questions, please note question # in front of your comments

THANK YOU FOR YOUR COOPERATION IN COMPLETING THE QUESTIONNAIRE

ANNEX D
CASE STUDIES OF USAID MISSION RESPONSES TO LAC/DR/RD SURVEY OF LAC MISSION AGRICULTURAL RESEARCH, EXTENSION, AND EDUCATION PROJECTS/PROGRAMS

USAID/BOLIVIA

Current Projects

Two current projects have components aimed at improving agricultural research, extension, and education (Ag REE). The Chapare Regional Development Project (511-0543) provides support for strengthening public agricultural research and extension, agricultural TG&T by private organizations, and agricultural education; the Private Agricultural Producer Organizations (511-0589) project provides some support for TG&T through private organizations.

Non-Project Assistance

The Mission indicated that it does not, excepting the High Valleys and Chapare, have a position with respect to using non-project assistance to stimulate change in public resources allocated to or governmental policies and programs relating to Ag REE institutions.

Progress of Public Agricultural Research Organizations

The Mission noted "much" progress in one category, traditional export crops, and "some" progress in 13 (33%) of 18 possible performance categories. Between "some" and "no" progress was noted for two categories, and "no" progress for two categories. The areas in which "no" progress was noted were—adapting technology for the production of import substitution crops and fisheries/aquaculture, respectively. The two areas rated as falling between "no" and "some" progress were: adapting technology for the production of staple food crops (e.g., corn, wheat, beans) and getting the private sector involved in identifying research problems and setting research priorities.

Progress of Public Agricultural Extension Organizations

Six (38%) of 16 categories were noted as having made "some" progress: identifying and making use of indigenous knowledge of farmers; drawing upon research-based technologies to extend technology tested as appropriate for specific site and farmer circumstances; maintaining a client-oriented approach, with emphasis on farmer participation in planning, execution, and evaluation, including involving all farm family members in culturally acceptable ways; working with and through groups and community leaders to achieve efficiency and to accelerate spread of recommended technology; using a variety of methods for communication and instruction, selected on tne basis of audience, objectives, and

circumstances; and monitoring adoption of recommended practices, adapting these to facilitate incremental adoption by farmers.

On the other hand, a rating of "no" progress was assigned to six (38%) categories: establishing a clear purpose statement—what organization does, who it serves, how it operates, how financed, and how evaluated; providing agricultural research system with information on existing farming systems, farmer problems, and performance of present and new technology under farm-level conditions; employing extension workers close in social distance to clients, and increasing their communication and organizational skills; improving extension workers' skills to conduct on-farm trials; providing systematic follow-up and follow through with farmers who adopt new technology to identify and solve unanticipated problems and facilitate adaptations in practices; and being responsive to new problems arising from use of new technology, such as storage, utilization, and marketing.

The Mission indicated that the host country had not sought to make progress in four areas: locating offices and providing staff transportation to facilitate ready two-way access between farmers and extension workers; making extension workers competent in technical subjects and diagnostic skills under farm and field conditions; establishing effective working links with all relevant parties—marketing agents, input suppliers, researchers, education, etc.; and maximizing use of mass media to generate interest, provide timely information, and recognize successful performances.

Progress of Agricultural Education Organizations

The Mission reported "some" progress in 12 (75%) of 16 categories. But "no" progress was reported for 3 categories: developing experiential ("learning by doing") approaches and incorporating these into the educational curricula; shifting from an emphasis on dispensing facts to passive students to an emphasis on problem-solving and development of learning, research, and management competencies; and developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation. The Mission indicated that the host country had not sought to make progress in one area: providing up-to-date text books and learning materials in the country's principal language of instruction.

Progress of TG&T Via Private Organizations

The Mission reported "some" progress in 17 (94%) of 18 categories. On the other hand, one area received a "no" progress rating: obtaining technology (e.g., germ plasm) from appropriate regional or international sources.

Adequacy of Public Agricultural Research Organization

All aspects of the adequacy of the research budget—overall amount, timely availability, and salaries, per diem, and equipment/supplies—were rated as "very poor." The adequacy of the numbers of trained technical Ph.D.- and M.Sc.-level personnel was rated as "very poor." While adequacy of the number of trained Ingeniero Agrónomo personnel was

rated as "average," the adequacy of trained Perito Agrónomo and administrative personnel was rated as "poor."

The adequacy of personnel administration systems was rated as "poor" (personnel recruitment, personnel evaluation, personnel development, and merit promotion), while the adequacy of program management systems was rated as "very poor" (program planning, program budgeting, program monitoring, and program evaluation).

Adequacy of Public Agricultural Extension Organization

Generally, most aspects of public sector agricultural extension were rated as "very poor." But there were a few exceptions. The adequacy of the number of trained Ingeniero Agrónomo personnel was rated higher ("poor"), as also the adequacy of personnel development systems and the performance criterion of how farmers rate extension. One performance criterion, quality of extension advise, was the highest rated item ("average").

Mission Funding for Agricultural TG&T Organizations

Mission funding for public sector agricultural research and extension, provided to IBTA, was increased during the 1980s to support developing alternative crops for the Chapare and High Valleys of Cochabamba. There was "somewhat" of an increase in funding for agricultural education as part of the Mission's DA support for participant training programs. For example, the Andean Scholarship Program includes 20 agricultural slots per year. Further, a PL-480 Title III local currency program has provided funding to set up pilot farms (e.g., model dairy farms), and to support agricultural student research programs in the University of Santa Cruz and a country-wide scholarship program for campesinos. This program has included short courses and assistance for completing vocational agricultural degrees in a wide range of subjects including agriculture. The Mission also has increased funding for private sector TG&T (P&) implemented through private sector cooperatives and producer organizations (e.g., funding for private sector research stations). This increase in funding for private TG&T has been influenced both by the difficulty of working with and through the public sector agricultural research and extension system as well as by AID's increased private sector emphasis in recent years.

Progress of Current Mission Projects

The Mission rated the Chapare Regional Development Project (511-0543) as having made some progress in each of the areas—technology generation in public research organizations, technology transfer in public extension organizations, agricultural education in agricultural education organizations, and agricultural TG&T through private organizations. The Mission indicated that the Private Agricultural Producer Organizations (511-0589) has made some progress with respect to agricultural TG&T through private organizations.

Constraints Internal to Public Sector Organizations

Two (or 33%) of the six factors were rated as a "major constraint": (1) unwillingness of the GOB to provide the funding required to cover the recurrent costs of field-level programs; and (2) lack of qualified human resources to carry out a sustained program to develop public sector agricultural research, extension, and education organizations. The remaining four factors were each rated as being "somewhat a constraint."

Constraints Internal to USAID/Country Mission

One factor was rated as being a "major constraint" to improving agricultural research, extension, and education when these functions are the responsibility of public sector organizations, namely, that the Mission does not have adequate staffing to deal effectively with agricultural research, extension, and/or education projects. Four of the six remaining factors were rated as being "somewhat a constraint," as follows:

- In spite of a general commitment to long-term institution-building, there is an operational push toward short-term projects having highly visible, relatively immediate impact.

- AID now emphasizes the private sector, rather than the public sector, as the principal means of development.

- AID now encourages an export-led agricultural development strategy, rather than a food security strategy.

- Mission strategy sees research, extension, and education separately rather than collectively (i.e., as being interrelated).

Mission Strategy for Improving Agricultural REE

The Mission identified the following as the priority issues relative to improving agricultural research, extension, and education in Bolivia: (1) sustained GOB commitment; (2) GOB strategy; (3) absence of an area/crop focus; and (4) human resources.

The Mission's strategy or plan to deal with these issues includes working with the private sector (especially wheat in Santa Cruz and flowers in Cochabamba); coordinating with other donors; and supporting crop-specific packages and not separate activities. The strategy is best articulated in Santa Cruz (wheat), Cochabamba (flowers), and Chapare (tropical products such as pineapple, tumeric, coffee, macadamia, and ginger).

The Mission indicated that its strategy/plan is to identify, develop, and implement projects involving all three REE functions. The Mission indicated its rationale as follows:

> The experience [of the] past 10 years, especially in credit programs and/or in other projects implemented [that] we consider [have worked is that] implementation must be

supported as a package (credit, technical assistance, extension, education, marketing, quality control, etc.).

Management Questions Facing the Mission

The Mission indicated a concern for increasing public and private sector involvement in agricultural research, particularly in non-traditional export crops. There is a feeling that the Mission should encourage greater private sector involvement in agricultural research. The Mission indicated that it would be helpful if there was a clear vision of what the GOB wants to do in this area and a valid commitment to carry through; however, this area is not viewed as a priority area of focus. Further, there is an absence of in-house expertise in the agricultural REE area. The Mission is currently developing its "alternative development" strategy in some detail.

Opportunities to be Pursued

The Mission noted that AID should emphasize policy dialogue and strategy formulation, encourage Bolivia to pass stronger environmental laws and to develop a natural resources strategy. Potential opportunities for other donors include resettlement in the Eastern Lowlands (IBRD) and integrated pest management (GTZ).

Program-Level Performance Monitoring System

The goals of the Mission's ARD portfolio are export promotion and development; a successful alternative development strategy; national resource conservation and development; and policy formulation. Specific indicators of success are: (1) increased coca eradication; (2) increased rural incomes; (3) increased km. of farm-to-market roads; (4) increase percentage of population with negative opinions about drug production and use; and (5) increased number of short-term jobs created under PL-480 (especially Food for Work). The Mission indicated that the ARD Office does not have an ARD program-level M&E plan but that the Mission has a program-level M&E plan.

USAID/ECUADOR

Current & Planned Projects

Several current projects have components aimed at improving agricultural research, extension, or education. Rural Technology Transfer Systems (518-0032) provides support for technology generation and transfer (TG&T) in the public and private sectors, while Forestry Sector Development (518-0023) is supporting public sector TG&T vis-a-vis forestry problems. Agricultural Research, Extension & Education (518-0068) is providing support for public and private TG&T as well as for agricultural education. Agricultural Education (518-0062) provides support for private agricultural education, while Sustainable Uses for Biological Resources (518-0069), which is in the design stage, will support public and private initiatives in technology generation and transfer.

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions, the Mission is developing a concept paper which proposes non-project assistance for agricultural research, extension, and education, with disbursements being conditional on performance. Options include assistance to the public sector agricultural research organization (INIAP), to the private sector, or to universities. Some combination of options may also be considered. On using non-project assistance to stimulate change in governmental policies and programs relating to research, extension, and education institutions, additional assistance to INIAP would be conditioned on autonomy and increased GOE budgetary support for this organization. The Mission is promoting increased private-public sector collaboration in research, extension, and education, especially through support to the private agricultural research, extension, and education foundation (FUNDAGRO).

Progress of Public Agricultural Research Organizations

The Mission noted "some" progress in 5 (28%) of the 18 categories, including obtaining technology from regional and international agricultural research organizations, developing on-farm trails as an integral part of an adaptive research program, and adapting technology for the production of staple food crops, livestock, and trees. A rating of "no" progress was assigned to the majority (10 or 56%) of the remaining measures except that the Mission indicated that the public agricultural research organization did not seek to make progress in either mobilizing support from the private sector or in improving its own internal organization and management.

Progress of Public Agricultural Extension Organizations

A rating of "some" progress was assigned to each of the 16 areas.

Progress of Agricultural Education Organizations

A rating of "some" progress was assigned to seven (44%) of the 16 areas, including identifying the project manpower requirements in the agricultural sector; developing or modifying the educational curricula to address manpower requirements; developing experiential ("learning-by-doing") approaches and incorporating these into the educational curricula; shifting from an emphasis on dispensing factors to passive students to an emphasis on problem-solving and development of learning, research, and management competencies; getting teaching staff involved in carrying out research on problems facing the agricultural sector; developing non-degree short courses to meet identified training needs of various audiences in the agricultural sector; and collaborating with agricultural extension organizations. The balance (9 or 56%) of areas were rated as having experienced "no" progress.

Progress of TG&T Via Private Organizations

The Mission reported "much" progress in two (11%) of the 18 areas—adapting technology for the production of non-traditional export crops and fisheries/aquaculture. On the other hand, the Mission indicated that the host country had not sought to make progress in the area of developing a program of on-farm trials as n integral part of an adaptive research program. while five areas were rated as having experienced "no" progress. These areas were: mobilizing research support from the public sector, improving the quality of the scientific and support staff of private sector research organizations, participating in national and regional research networks, participating in Collaborative Research Support Programs (CRSPs), and adapting technology for the production of trees.

A rating of "some" progress was assigned to 10 (56%) of the 18 areas, as follows: getting the private sector involved in identifying research problems and setting research priorities; mobilizing research support from the private sector; improving the internal organization and management of private sector research organizations; obtaining technology from appropriate regional or international sources; adapting technology for the production of staple food crops, livestock, traditional export crops, and import substitution crops; strengthening collaboration with agricultural extension organizations; and strengthening collaboration with agricultural education organizations.

Adequacy of Public Agricultural Research Organization

Generally, with a few exceptions, all areas were rated as "poor," the exceptions being the adequacy of the budget for per diem and the adequacy of systems for merit promotion being rated "very poor," while the adequacy of the numbers of trained technical (Ingeniero Agrónomo) and administrative personnel received the highest rating ("average").

Adequacy of Public Agricultural Extension Organization

With the exception of the performance measure of how farmers rate extension, which received a rating of "average," all other areas were rated as "poor" or "very poor," with

four areas being rated as low as "very poor," as follows: adequacy of the budget for per diem, adequacy of the numbers of trained personnel at the Ph.D. and M.Sc. levels, and the adequacy of systems for merit promotion.

Mission Funding for Agricultural TG&T Organizations

Mission funding for agricultural REE organizations during the 1980s increased in two areas—agricultural education and agricultural technology generation and transfer through private organizations. The Mission increased funding for agricultural education because the lack of trained manpower in agriculture is a significant constraint to development of the sector. The Mission provided support for training of Ecuadoreans at the Pan American Agricultural School at Zamorano (Honduras) as well as for strengthening teaching at several agricultural schools in Ecuador.

The increment in funding for private sector agricultural technology generation and transfer followed from the Mission's disenchantment with the public sector agricultural research, extension, and education system. The Mission "believed that private producer organizations, given their interest in gaining access to more productive technologies, would be more effective in carrying out technology generation and transfer than the public sector." However, the Mission indicated that its "thinking has evolved..., to consider that both the public and private sector must be involved and actively collaborating with each other if maximum results are to be achieved."

With respect to technology generation in public agricultural research organizations, project funding was reduced during the 1980s. The Mission indicated that: "There was no evidence of commitment on the part of the GOE to public agricultural research. In real terms, the budget declined over the period, and nearly all of INIAP's highly trained research personnel resigned to seek more rewarding employment elsewhere."

The Mission did not allocate any funding for technology transfer via public agricultural extension organizations because, in the Mission's words, there was "no viable public agricultural extension organization with which to work."

Progress of Current Mission Projects

The Mission rated the Agricultural Education (518-0068) as having made "much" progress in improving agricultural education, while the balance of the Mission's projects impacting on agricultural research, extension, or education were rated as having achieved "some" progress with resection to improving agricultural TG&T.

Constraints Internal to Public Sector Organizations

Two (33%) of the six factors were rated as a "major constraint": public agricultural organizations are weak and the problems of reforming them are too difficult to solve; and the country's government fails to see any benefit in investing more heavily in agricultural research, extension, and or education. Three (50%) of the factors were rated as "somewhat

a constraint," as follows: the country's government is unwilling to provide the funding required to cover the recurrent costs of field-level programs; the country lacks qualified human resources to carry out a sustained program to develop public sector agricultural research, extension, and education organizations; and there is a lack of demand for productivity-increasing technologies.

Constraints Internal to USAID/Country Mission

Two factors were rated as being "somewhat a constraint," as follows: AID now emphasizes the private sector, rather than the public sector, as the principal means of development; and the Mission does not have adequate staffing to deal effectively with agricultural research, extension, and/or education projects.

Mission Strategy for Improving Agricultural REE

The Mission stated that the greatest priority is "increased political commitment on the part of the GOE toward" agricultural research, extension, and education (REE).

> Over the past decade, the Government has allowed the REE system to steadily deteriorate. Highly trained agricultural scientists were forced to seek alternative employment due to the growing gap between the public sector salaries they received and what they could earn elsewhere.

A related priority, the Mission noted,

> is to forge a true REE system which involves public sector research and extension, private businesses and associations, and agricultural universities and schools. At present REE efforts are fragmented, communication is poor, and results have therefore suffered.

A third priority "is to allocate scarce REE resources more efficiently. The public sector research program, for example, is trying to address too many commodities with too few resources, with the result that progress has been limited in all areas."

The Mission's strategy or plan includes developing a concept paper for non-project assistance to agricultural REE in Ecuador.

> If any funds are to be provided to the public sector, the GOE must agree to make INIAP autonomous (so that, among other things, it can increase salaries for agricultural scientists) as well as to significantly increase the budget for INIAP. AID funds may also be increased to support REE efforts in the private sector and at agricultural schools. The Mission intends to continue to channel its assistance to REE primarily through the Foundation for Agricultural Development (FUNDAGRO), which has made excellent progress over the past three years in carrying out its REE programs and in establishing itself institutionally.

The Mission indicated that its strategy/plan entail identifying, developing, and implementing projects that involve all three functions—research, extension, education. The Mission' rationale for this approach is that sustaining improvements in

> agricultural productivity and management of natural resources requires that all three functions—research, extension, and education—be strengthened on a continuing basis. Public-private sector collaboration, enable by sustained political support, is vital to the establishment and maintenance of a strong REE system.

Management Questions Facing the Mission

The Mission indicated that support to agricultural REE "must remain a priority in the...agriculture and natural resources portfolio" of USAID/Ecuador. But increased funding for public sector research will depend on the GOE demonstrating a commitment to

> rebuilding REE, e.g., collaborative arrangements between private producer associations and Ecuadorean agricultural schools, can yield benefits, but their magnitude will be somewhat limited. Maximum impact can be achieved only if all...parties, including the public sector, are involved and working together to identify problems, test solutions, and extend new knowledge and technologies to producers.

However, as the Mission notes, the "roles of these actors must be well-defined." As an example, organized producers of export crops probably should take the lead in financing REE activities for their commodities, while INIAP should concentrate on products produced primarily for domestic consumption. The Mission noted that it is or soon will be addressing REE management questions:

> This will be based upon the just finished Agricultural Assessment of Ecuador, a concept paper on non-project assistance for REE, and an assessment of the country's natural resource sector to be carried out over the next two years. Management issues in natural resources will also be considered during the...design of the Sustainable Uses for Biological Resources project.

Opportunities to be Pursued

The Mission indicated that "non-project assistance to INIAP, perhaps including some technical assistance, seems promising, provided that the GOE fulfills it obligations. Our existing project with FUNDAGRO should be sufficient to handle most activities in the REE area at least through April of 1993." With respect to other donors, the Mission noted that the Inter-American Development Bank has financed a large REE program called PROTECA, which is implemented by the Ministry of Agriculture. But "the program has floundered, expenditures have been very slow, and impact negligible. Given this experience, it may be advisable for other donors to work through FUNDAGRO or other private organizations, or through the limited number of agricultural technical schools with some REE capability."

Program-Level Performance Monitoring System

The ANRO portfolio contributes to the LAC Bureau's goals of "basic structural reforms leading to rapid and sustained economic growth." Specific objectives include: (a) to increase agricultural productivity; (b) to preserve and manage natural resources; and (c) to strengthen private enterprise and promote exports. While the Mission indicated that country performance indicators for each of these objectives are provided in the FY 91-92 Action Plan, the Mission does not have an ANR program-level M&E plan. The ANR Office has attempted to improve the M&E system, primarily on a project-by-project basis, mainly through interaction between USAID/Ecuador project officers and host country counterparts. The Mission noted that "results have been mixed, with relatively good M&E systems established in some projects and less than satisfactory systems in others. In some cases, long-term contractor personnel have been asked to provide M&E evaluation data for semi-annual reports, the Action Plan, etc. because implementing agencies had not implemented an effective M&E system.

USAID/PERÚ

Current & Planned Projects

The Mission identified only one project, Agricultural Technology Transfer (ATT) (527-0282) having a research, extension, and/or education component. ATT is to run from 8/87 to 8/93. The project is being implemented by a mix of public and private organizations—the National Institute for Agricultural and Agro-Industry Research, the National Agrarian University, the National Agrarian Organization, and the Fundación para el Desarrollo Agropecuario. Technical assistance is being provided by the North Carolina State University.

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions, the Mission noted that "PL-480 generated local currency provides an important resource for implementing agencies." Using project funds to cover the operating expenses of agricultural REE institutions would "deplete any project funds and severely weaken the effects of...any such project." While recognizing the importance of non-project assistance as a funding source, the Mission indicated that using such funds to stimulate change in the level of public resources allocated to agricultural REE institutions is "questionable."

With regard to using non-project assistance to stimulate change in governmental policies and programs relating to agricultural REE institutions, the Mission noted that "stimulation of change is not immediately apparent and likely questionable." However, the availability of non-project assistance as a "funding source provides a means of contact and dialogue which likely, but indirectly, influences change."

Progress of Public Agricultural Research Organizations

The Mission noted "some" progress in 14 (78%) of the 18 categories. Areas in which "no progress" was identified as having been made were mobilizing government funding for research, mobilizing private funding for research, and collaborating with agricultural extension organizations. The Mission reported that Perú had not given public research any mandate to develop technology for import substitution crops.

Progress of Public Agricultural Extension Organizations

The Mission reported that "no" progress has been made in any of the 16 categories.

Progress of Agricultural Education Organizations

The Mission reported "some" progress in 6 (38%) of the 16 categories, including shifting to an emphasis on problem-solving educational approaches; collaborating with agricultural research organizations; developing non-degree short courses for target audiences;

developing a diversified mix of funding by private, public, and international sources; developing the university's links with external knowledge sources; and providing up-to-date text books and learning materials in Spanish. A "no" progress rating was assigned to all other categories, except that one item (analyzing how the educational system is responding to Perú's agricultural manpower requirements) was rated as an area in which Perú had not sought to make progress.

Progress of TG&T Via Private Organizations

The Mission reported "much" progress in 3 (17%) of the 18 categories—obtaining technology from appropriate regional or international sources, participating in national and regional research networks, and adapting technology for the production of staple food crops, while "some" progress was made in 8 (46%) of the 18 categories. The areas in which "no" progress has been made are: mobilizing funding support from the public sector; strengthening collaboration with agricultural extension organizations; and adapting technology for the production of livestock, traditional export crops, import substitution crops; non-traditional export crops, and trees, although "some" progress had been made in aquaculture.

Adequacy of Public Agricultural Research Organization

All aspects of the adequacy of the research budget as well the adequacy of administrative and management systems were rated as "very poor." By comparison, the adequacy of the number of trained research persons at various levels was rated by the Mission as "good," although the number of trained administrative personnel was only rated as "average."

Adequacy of Public Agricultural Extension Organization

The pattern of constraints for the adequacy of the agricultural extension organization was exactly the same as that described for the adequacy of the public agricultural research organization, i.e., the numbers of trained personnel being rated as "good" and budget, administrative, and management systems being rated as "very poor." Further, the performance of the public agricultural extension service was rated as "very poor" in all three dimensions (% of farmers reached, quality of extension advice, and farmer rating of extension).

Mission Funding for Agricultural TG&T Organizations

Mission funding for agricultural REE organizations during the 1980s increased in all four categories—public research, public extension, agricultural education, and agricultural TG&T through private organizations. The relative success of the earlier Agricultural Research, Extension, and Education project "prompted" continued support for including public agricultural research as a component of the ATT project. While agricultural extension had declined during the years of the military government, the change in leadership on return to a democratically-elected government encouraged the Mission to promote extension; however, the Mission notes that "political intervention dealt a death blow to extension."

Support for agricultural education was motivated by a belief that the good reputation once enjoyed by the National Agrarian University could be reestablished. Mission support for agricultural TG&T through private organizations was prompted by the recognition that private organizations generally have been "the avant garde for progress."

Progress of Current Mission Projects

The Mission rated the ATT project (598-0282) as having made "some" progress in technology generation in public agricultural research organizations, TG&T through private organizations, and agricultural education. On the other hand, the project was rated as having made "no" progress with respect to technology transfer via public extension organizations.

Constraints Internal to Public Sector Organizations

Two factors were rated as "somewhat a constraint": (1) that public agricultural organizations are weak and the problems of reforming them too difficult to solve; and (2) that the country's government is unwilling to provide the funding required to cover the recurrent costs of field-level programs.

Constraints Internal to USAID/Country Mission

The only factor identified as a constraint ("somewhat a constraint") is that the Mission does not have adequate staffing to deal effectively with agricultural research, extension, and education projects.

Mission Strategy for Improving Agricultural REE

The Mission responded that sound financial management across all sectors is vital to the GOP and that administrative, finance, and technical leadership need to be improved. But the Mission stressed that:

> Support of the educational system, research network, [and] technology transfer <u>cannot</u> be the function of the international donor community. The government must be made aware of a need to carry out sound policies related to agriculture in order to encourage production, related marketing, export management and credit.

Further, in the context of Perú, there is a need to deal with terrorism in order "to provide the security" to accomplish development of the agricultural sector.

The Mission's strategy to deal with these problems is to support policy change, encourage fiscal adjustments, educate against narcotics, support the government's anti-terrorism activities, promote modernization of the legal system, and promote democracy. This strategy "is based on the principle that getting the house in order is a prerequisite for change." But the Mission also indicated that it's strategy/plan includes identifying, developing, and implementing projects that include all three functions—research, extension, and education.

Management Questions Facing the Mission

Three questions were identified: (1) Should USAID/Perú continue to support public sector agricultural research? (2) Should USAID/Perú attempt to develop a better public sector research capacity? (3) To what extent should USAID/Perú continue support to the agricultural education system? In considering these questions, the Mission noted that "strategy development appears to be the most elusive element," with politics playing an important role in any initiative's success or failure.

Opportunities to be Pursued

The Mission noted seed production and extension (broadly defined as including research, technology, and management) and livestock promotion as opportunities that should be pursued by AID. By comparison, opportunities for other donors include transportation networks since this is an area in which AID does not work.

Program-Level Performance Monitoring System

The goals of the Mission's ARD portfolio are: (1) to decrease the illicit production of coca leaves; and (2) to promote gainful employment as a substitute for income related to coca production. However, the Mission reported that the ARD Office does not have an ARD program-level M&E plan.

Additional Considerations

The Mission noted that: "The unique, chaotic, hyperinflationary character of this country, complicated by high security risk and [a] drug dependent economy makes answering this type of questionnaire most difficult. Historically the country has seen its worst in terms of [agricultural research and extension] in the past 3 decades. Likewise, it has seen its worst in financial stability during the past four years."

USAID/DOMINICAN REPUBLIC

Current & Planned Projects

Several current and planned projects have components aimed at improving agricultural research, extension, or education. On-Farm Water Management (517-0159) and Agricultural Policy Analysis (517-0156) provide support for public agricultural research, and On-Farm Water Management provides support for public agricultural extension. University Agribusiness Partnership (517-0243) and Agricultural Sector Training (517-0160) provide support for agricultural education. Also, University Agribusiness Partnership, as well as Commercial Farming Systems (517-0214) and Agribusiness Promotion (517-0186) support agricultural TG&T through private organizations. The projects being implemented through public organizations are Agricultural Policy Analysis (National Agricultural Council), On-Farm Water Management (National Institute of Hydraulic Resources), and Agricultural Sector Training (National Office of Planning). Agribusiness Promotion is being implemented by the private Joint Agricultural Coinvestment Council (JACC). A combination of public/private implementation is being followed in the University Agribusiness Partnership [Superior Institute of Agriculture (ISA)] and Commercial Farming Systems (Central Bank and the Agricultural Development Foundation) projects.

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions, the Mission is "actively involved in channeling resources to [the] most productive and effective institutions, both public and private." With regard to using non-project assistance to stimulate change in governmental policies and programs relating to agricultural REE institutions, the Mission "actively lobbies to modify policies and programs to benefit such institutions."

Progress of Public Agricultural Research Organizations

The Mission noted "some" progress in 2 (11%) of the 18 categories, including participating in national and regional research networks and participating in Collaborative Research Support Programs (CRSPs). But the bulk of the categories, a total of 13 or 72%) ware rated as having seen "no" progress. Further, three categories were rated as being areas in which the host country had not sought to make progress, including developing on-farm trials as an integral part of an adaptive research program, adapting technology for fisheries/aquaculture, and mobilizing private sector support for agricultural research.

Progress of Public Agricultural Extension Organizations

Nine (56%) of the categories were rated as having seen "no" progress, while the balance were indicated to be areas in which the host country had not sought to make progress.

Progress of Agricultural Education Organizations

Seven (44%) of the categories were rated as having achieved "much" progress, as follows:

- Identifying the project manpower requirements in the agricultural sector.
- Developing or modifying agricultural education curricula to address identified manpower requirements.
- Developing experiential ("learning by doing") approaches and incorporating these into the educational curricula.
- Shifting from an emphasis on dispensing facts to passive students to an emphasis on problem-solving and development of learning, research, and management competencies.
- Developing non-degree short courses to meet identified training needs of various audiences in the agricultural sector.
- Developing a diversified mix of funding by private, public, and international sources.

A rating of "some" progress was assigned to three (19%) of the categories—developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation, getting teaching staff involved in carrying out research on problems facing the agricultural sector, and collaborating with agricultural research organizations.

A rating of "no" progress was assigned to five (31%) of the categories—developing strategic planning (envisaging and programming for the needs of the future) as a management tool; developing the flexibility for university staff to allocate and share time according to problems faced by the agricultural sector rather than the discipline in which staff members were trained; developing training programs in agricultural research management and organization; developing the university's links with worldwide sources of agricultural knowledge; and providing up-to-date text books and learning materials in Spanish.

The Mission indicated that the host country had not sought for agricultural education organizations to collaborate with agricultural extension organizations.

Progress of TG&T Via Private Organizations

The Mission reported "much" progress in 10 (56%) of the 18 categories and "some" progress in 7 (39%) of the categories. The areas of "some" progress are:

- Participating in national and regional research networks.

- Participating in Collaborative Research Support Programs (CRSPs).

- Adapting technology for the production of staple food crops, livestock, trees, and fisheries/aquaculture.

- Strengthening collaboration with agricultural extension organizations.

Adequacy of Public Agricultural Research Organization

The public agricultural research organization received a rating of "very poor" on almost all of the categories, except for the following deviations:

- The adequacy of the budget for salaries of urban-based and field-based technical personnel and administrators was rated slightly higher, only "poor" (compared with "very poor").

- With respect to the adequacy of the numbers of trained staff, the number of trained technical M.Sc.-level persons was rated as "good," while the numbers of technical Ph.D.-level and Ingeniero Agrónomo staff was rated slightly lower ("average"); the adequacy of the number of Perito Agrónomo staff was rated as "poor."

Adequacy of Public Agricultural Extension Organization

The rating pattern for the adequacy of public agricultural research organizations was repeated exactly in the Mission's rating of the adequacy of public agricultural extension. With respect to the performance of public agricultural extension, all three measures received a rating of "very poor."

Mission Funding for Agricultural TG&T Organizations

Mission funding for public agricultural research and extension organizations was reduced during the 1980s. These public organizations were described as "incapable, non-viable, underfunded, overstaffed, [and subject to] constant turnover." On the other hand, the Mission increased funding for agricultural education organizations, "to meet changing demand for technicians, not academics or MBAs." Mission funding for private agricultural TG&T also increased as the "only viable alternative."

Progress of Current Mission Projects

With respect to agricultural education, the Mission rated the Agricultural Sector Training project as having achieved "much" progress. Similarly, "much" progress in agricultural TG&T through private organizations was achieved on the Agribusiness Promotion project, while "some" progress was achieved in this same area by the Commercial Farming Systems project. A measure of "some" progress was identified as having been made on the On-Farm Water Management and Agricultural Policy Analysis projects vis-a-vis

public agricultural research, while On-Farm Water Management also was rated as having made "some" progress with respect to technology transfer via public agricultural extension.

Constraints Internal to Public Sector Organizations

Three (of 50%) of the six factors were rated as a "major constraint": (1) public agricultural organizations are weak and the problems of reforming them are too difficult to solve; (2) the government's unwillingness to provide the funding required to cover the recurrent costs of field-level programs; and government failure to see any benefit in investing more heavily in agricultural research, extension, or education.

Constraints Internal to USAID/Country Mission

One factors was rated as being a "major constraint," namely, that the Mission does not have adequate staffing to deal effectively with agricultural research, extension, and/or education projects. Two factors were rated as "somewhat a constraint"—AID now emphasizes the private sector, rather than the public sector, as the principal means of development; and (2) AID now encourages an export-led agricultural development strategy, rather than a food security strategy.

Mission Strategy for Improving Agricultural REE

The Mission identified "establishing sustainable effective institutions" as the priority issue with respect to improving agricultural research, extension, and education. The Mission's strategy is to "continue to channel resources to [the] most effective institutions which can be made sustainable." This strategy includes identifying, developing, and implementing projects involving all three functions—research, extension, and education. This strategy is influenced by a recognition of the "total interrelationships among the three" and that there has been "no apparent change in GODR policies."

Management Questions Facing the Mission

The Mission indicated that it "should continue present course" but expressed concern "how to accomplish [this] with reduced Mission resources."

Opportunities to be Pursued

The Mission noted the following as opportunities that should be pursued by AID: debt-for-education swaps; endowment funds, and training. Donors should pursue opportunities in infrastructure and technical assistance.

Program-Level Performance Monitoring System

The goals of the Mission's ARD portfolio are: "Sustained and equitably distributed private sector-led economic growth and social development in a democratic environment though rapid diversification of the agricultural sector into non-traditional crops with foreign

exchange earning potential." The Mission indicated that it does not have an ARD program-level M&E plan. However, at the project level, the Mission is monitoring progress toward the stated End of Project Status (EOPS) indicators.

USAID/HAITI

Current & Planned Projects

USAID/Haiti identified three projects as having agricultural research, extension, or education components. Target Watershed Management (521-0191), being implemented by the Associates in Rural Development (ARD), the University of Florida, and local NGOs; Agroforestry Program (521-0217), being implemented by the Pan American Development Foundation (PADF), CARE, and SECID (Auburn University); and Coffee Revitalization Project (521-0216), being implemented by the Inter-American Institute for Cooperation on Agriculture (IICA). All of these projects are being implemented by private sector organizations.

Non-Project Assistance

The Mission indicated that it has no bilateral programs at this time.

Progress of Public Agricultural Research Organizations

The Mission noted "some" progress in 9 (50%) of the 18 categories, including getting the private sector involved in identifying agricultural research problems and setting research priorities, obtaining technology from regional and international agricultural research organizations, participating in national and regional research networks, and develop on-farm trials as an integral part of an adaptive research program. Also, the rating of "some" progress was assigned to adapting technology for the production of staple food crops, livestock, traditional export crops, non-traditional export crops, and trees.

The rating of "no" progress was assigned to five areas, as follows: mobilizing support for agricultural research from the private and public sectors, collaborating with agricultural extension and agricultural education organizations, and adapting technology for fisheries/aquaculture.

The Mission indicated that Haiti had not sought to improve the internal organization and management of public agricultural research organizations, to improve the quality of the scientific and support staff of public agricultural research organizations, to participate in Collaborative Research Support Programs (CRSPs), or to adapt technology for the production of import substitution crops.

Progress of Public Agricultural Extension Organizations

Only two (13%) categories were identified as having made "some" progress: drawing upon research-based technologies (varieties, practices) to extend technology tested as appropriate for specific site and farmer circumstances, and working with and through groups and community leaders to achieve efficiency and to accelerate the spread of recommended technology.

A "no" progress rating was assigned to 11 (69%) categories, while the host country did not seek to make progress in three areas: establishing a clear purpose statement—what organization does, who it serves, how it operates, how financed, and how evaluated; providing the agricultural research system with information on existing farming systems, farmer problems, and performance of present and new technology under farm-level conditions; and identifying and making use of farmers' indigenous knowledge.

Progress of Agricultural Education Organizations

The Mission reported "some" progress in only one (6%) of the 16 categories, namely, collaborating with agricultural research organizations. A rating of "no" progress was assigned to 7 (44%) areas, while the Mission indicated that the host country had not sought to make progress in 8 (50%) of the areas.

Progress of TG&T Via Private Organizations

The Mission reported "some" progress in 6 (33%) of the 18 categories—improving the internal organization and management of private agricultural research organizations, improving the quality of the scientific and support staff of private sector research organizations, obtaining technology from appropriate regional or international sources, participating in national and regional research networks, and adapting technology for the production of traditional export crops and trees. A rating of "no" progress was assigned to two (11%) categories—mobilizing research support from the public sector and adapting technology for the production of livestock. The Mission indicated that the host country had not sought to make progress in 10 (56%) of the categories.

Adequacy of Public Agricultural Research Organization

The Mission rated as "average" the adequacy of the budget for salaries, although the overall adequacy of the budget, particularly with respect to per diem and equipment/supplies, was rated as "very poor." The numbers of trained research personnel was rated as "average," although the adequacy of the number of trained administrative personnel was rated as "poor." Research personnel administration aspects were uniformly rated as "very poor," while research management aspects were rated only slightly higher (i.e., "poor").

Adequacy of Public Agricultural Extension Organization

The rating pattern assigned in the case of the adequacy of the public agricultural research organization was also assigned in the case of the adequacy of the public agricultural extension organization, with one exception—the research management aspects were not uniformly rated "poor" but instead were uniformly rated as "very poor." While the quality of extension advise was rated as "average," the other two extension performance measures (% of farmers reached by extension and farmer rating of extension) were both assigned a rating of "very poor."

Mission Funding for Agricultural TG&T Organizations

USAID/Haiti funding for public agricultural research and extension was terminated during the 1980s due to a Congressional Mandate, while the Mission did not allocated any funding to agricultural education since this areas was "not part of the overall strategy and focus" of the Mission's assistance program. However, the Mission increased funding for the improvement of agricultural TG&T through private organizations. In this regard, the Mission noted that "past experience and current evidence suggest that agricultural development programs [are] most likely to have [a] positive impact when channeled through PVO and NGO networks."

Progress of Current Mission Projects

The Mission rated Agroforestry Program (521-0217) as having made "much" progress and Target Watershed Management (521-0191) as having made "some" progress in improving technology generation and transfer through private organizations. The Mission noted that it is too early yet to assess progress on Coffee Revitalization (521-0216).

Constraints Internal to Public Sector Organizations

Three (50%) of the six factors were rated as a "major constraint": (1) host country is too small to support a public agricultural research, extension, and education effort; (2) public agricultural organizations are weak and the problems of reforming them are too difficult to solve; and (3) unwillingness of the Government of Haiti (GOH) to provide the funding required to cover the recurrent costs of field-level programs. Two of the factors were identified as being "somewhat a constraint"—failure of the GOH to see any benefit in investing more heavily in agricultural research, extension, or education; a lack of demand for productivity-increasing technologies.

Constraints Internal to USAID/Country Mission

Two of the seven factors were rated as being "major constraints" to improving agricultural research, extension, and education when these functions are the responsibility of public sector organizations: (1) Mission strategy sees research, extension, and education separately rather than collectively (i.e., as being interrelated); and (2) Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner. Four factors were identified as being "somewhat a constraint": (1) In spite of a general commitment to long-term institution-building, there is an operational push toward short-term projects having highly visible, relatively immediate impact; (2) AID now emphasizes the private sector, rather than the public sector, as the principal means of development; (3) AID now encourages an export-led agricultural development strategy, rather than a food security strategy; and (4) in spite of a recognized need for production-oriented sustainable agriculture, there is an operational push toward conservation-oriented natural resource management projects.

Mission Strategy for Improving Agricultural REE

The Mission identified the following as the priority issues relative to improving agricultural research, extension, and education in Haiti: (1) political stability and continuity; (2) readjustment of the government's budget; and (3) effective donor planning and coordination. The Mission, recognizing that the above issues "exist primarily for reasons beyond the control of the USAID," indicated that it will continue with its present strategy of targeting the Mission's agriculture and soil and water conservation efforts on "the hillside, rural population through PVOs and NGOs."

The Mission indicated that its strategy/plan is to identify, develop, and implement projects involving agricultural research and extension. The underlying rationale for this strategy, as expressed by the Mission, is:

> Previous practical experience, historical assessments and evaluations all indicated that soil and water are the number one limiting constraint to improved agricultural production in Haiti. This fact, coupled with a 75% rural hillside population, has led to our present Mission strategy.

Management Questions Facing the Mission

The Mission identified the following four questions as being most important:

1. Should the Mission maintain its narrow hillside focus on agriculture or expand to impact those areas which might have more immediate, macro-level impact.

2. Should the Mission support revitalization of the public sector research capabilities?

3. Should the Mission continue to support creation and expansion of research units through project structures?

4. Should the Mission continue to expand extension activities through PVOs?

In order to address these issues, the Mission indicated that attention needs to be address to the broad question of policy analysis, including the preparation of scopes of work for such policy analysis and associated studies (assessments) and strategy formulation.

Opportunities to be Pursued

The Mission noted four areas of opportunity that should be pursued by other donors: (1) introduction and testing of drought resistant cereals; (2) identification and use of farm byproducts as sources of animal feed; (3) integration of livestock production and aquaculture; and (4) strengthening of public sector capability for extension activities.

Program-Level Performance Monitoring System

The goal of the Mission's ARD portfolio is: "To ultimately increase on farm income and productivity through the development and extension of sustainable agricultural production systems which concentrate on the integration of perennial crops with soil and water conservation practices on the hillsides."

The Mission indicated that it does not have an ARD program-level M&E plan. The ARD Office does not have a formalized M&E plan per se. "However, all projects keep track of a central common set of project outputs which reflect progress towards the achievement of purpose level indicators."

USAID/JAMAICA

Current & Planned Projects

Several current projects have components aimed at improving agricultural research, extension, or education. Agricultural Education (532-0082) is supporting improved agricultural education. The Jamaica Agricultural Research (532-0128) is providing support for improved technology generation and transfer through private organizations and for improved technology generation in public agricultural research organizations. Hillside Agriculture (532-0101) is providing support for improved technology transfer through public extension organizations. The Agricultural Export Services (532-0165) is providing support for improved agricultural technology generation in public research organizations.

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions, the Mission stated that, under the PL-480 Title I self-help measures, USAID/Jamaica has required the Government of Jamaica (GOJ) to undertake research and implement small farmer outreach programs in the dairy sector. The local currency that is generated from the Title I program is used to finance, among other things, GOJ contribution to bilateral and multilateral donor projects in these areas.

With respect to using non-project assistance to stimulate change in governmental policies and programs relating to agricultural REE institutions, the Mission stated that the self-help measures include agreements on various policies and programs relating to agricultural research, extension, and education. A standard self-help measure agreed to each year is that the GOJ collaborate with the USDA in the general area of animal and plant health.

Progress of Public Agricultural Research Organizations

The Mission noted "much" progress in one (6%) of the 18 categories—adapting technology for fisheries/aquaculture, while "some" progress was noted in five (28%) of the categories, as follows: participating in national and regional research networks; developing a program of on-farm trials as an integral part of an adaptive research program; adapting technology for the production of livestock and traditional export crops; and collaborating with agricultural extension organizations.

A rating of "no" progress was assigned to 10 (18%) of the categories, including mobilizing support for agricultural research from the public sector; improving the internal organization and management of public sector agricultural research organizations; improving the quality of the scientific and support staff of public sector agricultural research organizations; obtaining technology from regional and international agricultural research organizations; participating in Collaborative Research Support Programs (CRSPs); adapting technology for the production of staple food crops, import substitution crops, non-traditional export crops, and trees; and collaborating with agricultural education organizations.

The Mission indicated that the host country had not sought to make progress in two areas: getting the private sector involved in identifying agricultural research problems and setting research priorities, and mobilizing support for agricultural research from the private sector.

Progress of Public Agricultural Extension Organizations

With the exception of one area (namely, "maintaining a client-oriented approach...") rated as having experienced "much" progress, all of the remaining areas were rated as having achieved "some" progress.

Progress of Agricultural Education Organizations

The Mission reported "some" progress in all areas except three, all of which were rated as having experienced "no" progress, as follows—developing strategic planning as a management tool, developing the flexibility for university staff to allocate and share time according to problems faced by the agricultural sector, and analyzing how the education system is responding to the country's agricultural manpower requirements.

Progress of TG&T Via Private Organizations

For this category, the Mission provided ratings on a project-specific basis, as follows:

Hillside Agriculture

Six (33%) areas were identified as having had "no" progress, as follows: obtaining technology from appropriate regional or international sources; participating in Collaborative Research Support Programs (CRSPs); adapting technology for the production of staple food crops, import substitution crops, and non-traditional export crops; and strengthening collaboration with agricultural extension organizations.

Ten (56%) categories were rated as having experienced "some" progress, including getting the private sector involved in identifying research problems and setting research priorities; mobilizing research support from the public and private sectors; improving the internal organization and management of private sector research organizations; improving the quality of the scientific and support staff of private sector research organizations; participating in national and regional research networks; adapting technology for production of livestock and traditional export crops; and strengthening collaboration with agricultural extension organizations.

A rating of "much" progress was reported in 3 (17%) of the 18 categories—developing a program of on-farm trials as an integral part of an adaptive research program, and adapting technology for the production of trees <u>and</u> fisheries/aquaculture.

Jamaica Agricultural Development Foundation (JADF)

A rating of "no" progress was assigned to three areas, as follows: improving the quality of the scientific and support staff of private sector research organizations, obtaining technology from appropriate regional or international sources; and participating in Collaborative Research Support Programs (CRSPs) (which programs may not include crops relevant to the program of the JADF).

A rating of "some" progress was noted in 11 (61%) of the areas, including: mobilizing research support from the public and private sectors,; improving the internal organization and management of private sector research organizations; participating in national and regional research networks; developing a program of on-farm trials as an integral part of an adaptive research program; adapting technology for the production of staple food crops, livestock, import substitution crops, and trees; and strengthening collaboration with agricultural extension and education organizations. A rating of "much" progress was assigned to four areas, as follows: getting the private sector involved in identifying research problems and setting research priorities, and adapting technology for the production of traditional export crops, non-traditional export crops, and fisheries/aquaculture.

Jamaica Agricultural Research Program (JARP)

While JARP had not sought to strengthen collaboration with extension organizations, the program had achieved "much" progress in four areas, including mobilizing research support from the private sector, developing on-farm trials as an integral part of an adaptive research program, adapting technology for the production of livestock and fisheries/aquaculture. A rating of "some" progress was assigned to the balance (13 or 72%) of the areas.

Adequacy of Public Agricultural Research Organization

While the Mission rated the adequacy of the numbers of trained 2-year vocational school equivalent and administrative personnel as being "average," all other items were rated as "poor" or "very poor." Areas rated as "very poor" were the adequacy of the overall budget, adequacy of the budget for equipment/supplies, adequacy of the number of trained Ph.D.-level technicians, and all aspects of research personnel administration (except personnel recruitment rated as "poor") and research management (except program planning rated also rated as "poor").

Adequacy of Public Agricultural Extension Organization

Two aspects (% of farmers reached by extension and quality of extension advice) were rated as "poor," while the farmers' rating of extension was seen as being "very poor."

The adequacy of the budget for equipment/supplies was also rated as "very poor," while the adequacy of the number of trained 2-year vocational equivalent staff was rated as "good." All other aspects were rated as "average" or "poor," the areas being rated as

"poor" being the following: budget available on a timely basis, adequacy of the budget for field-based technical personnel and per diem, adequacy of the number of trained Ph.D.-level technicians, and adequacy of systems for personnel recruitment and merit promotion as well as all research management systems except program monitoring which was rated slightly higher as "average".

Mission Funding for Agricultural TG&T Organizations

All areas—public research, public extension, education, and private technology generation and transfer—experience increased Mission funding during the 1980s. The Mission noted that public sector research needed strengthening because it had steadily declined since the late 1970s. The Mission provided funding for public extension during the 1980s because IMF mandated cutbacks in 1984-85 had severely affected the extension service. With respect to agricultural education, Mission funding for agricultural education followed from the government having closed the only agricultural tertiary institution; this resulted in a need for a continuing education facility specifically for agriculture. In the area of technology generation and transfer through private organizations, the Mission provided the following rationale for its increased investment in this area during the 1980s:

> 1. Efforts to strengthen public sector had been largely unsuccessful. 2. More emphasis on technical transfer rather than generation. 3. Failure to implement projects in the public sector.

Progress of Current Mission Projects

The Mission rated the Agricultural Education (532-0082) as having achieved "much" progress, while the Jamaica Agricultural Research (532-0128) project was rated as having had "some" progress in terms of improving technology generation and transfer through a private organization (Jamaica Agricultural Development Foundation), while the Mission rated it as being "too early" to assess progress vis-a-vis public agricultural research organizations. The Hillside Agriculture (532-0101) project was rated as having had "some" progress with technology transfer via public agricultural extension organizations.

Constraints to Agricultural Research

The Mission provided separating ratings of constraints for each of the three REE functions—research, extension, and education (see annex to this case study).

Agricultural Research

With respect to constraints internal to public sector organizations, all of the six factors were rated as being at least "somewhat a constraint," with two factors rated as "major constraints," namely, that public agricultural organizations are weak and the problems of reforming them too difficult to solve, and that the government is unwilling to provide the funding required to cover the recurrent costs of field-level programs.

With respect to constraints internal to USAID/Jamaica, four factors were rated as "somewhat a constraint," as follows:

- In spite of a general commitment to long-term institution-building, there is an operational push toward short-term projects having highly visible, relatively immediate impact.

- AID now emphasizes the private sector, rather than the public sector, as the principal means of development.

- Mission strategy sees research, extension, and education separately rather than collectively (i.e., as being interrelated).

- Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.

Agricultural Extension

With respect to constraints internal to public sector organizations, only three factors were rated, all as "somewhat a constraint," namely, that Jamaica is too small to support a public sector extension effort, that public agricultural organizations are weak and the problems of reforming them are too difficult to solve, and that Jamaica's government is unwilling to provide the funding required to cover the recurrent costs of field-level programs.

With respect to constraints internal to USAID/Jamaica, three factors were rated as "somewhat a constraint," as follows:

- AID now emphasizes the private sector, rather than the public sector, as the principal means of development.

- Mission strategy sees research, extension, and education separately rather than collectively (i.e., as being interrelated).

- Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.

Agricultural Education

With respect to constraints internal to public sector organizations, only two factors were rated. A rating of "major constraint" was assigned to the statement that public agricultural organizations are weak and the problems of reforming them are too difficult to solve, while a rating of "somewhat a constraint" was assigned to the statement that Jamaica lacks qualified human resources to carry out a sustained program to develop a public sector agricultural education organization.

With respect to constraints internal to USAID/Jamaica, three factors were rated. Identified as a "major constraint" were the following

- AID now encourages an export-led agricultural development strategy, rather than a food security strategy.

- Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.

Rated as "somewhat a constraint" was the statement that AID now emphasizes the private sector, rather than the public sector, as the principal means of development.

Summary

If the ratings for each statement are summed across research, extension, and education ratings, this provides a way of ranking the relative importance of each constraint. In other words, such a ranking tells which constraints were more frequently rated as being constraints. With respect to constraints internal to public sector organizations, the following ranking of constraints appeared (note that some constraints tied):

Rank

1 Public agricultural organizations are weak and the problems of reforming them are too difficult to solve.

2 The country's government is unwilling to provide the funding required to cover the recurrent costs of field-level programs (e.g., farm-level trials).

3 Tie between: Host country is too small to support a public sector agricultural research, extension, and education effort; and Jamaica lacks qualified human resources to carry out a sustained program to develop public sector agricultural research, extension, and education organizations.

4 Tie between: Jamaica's government fails to see any benefit in investing more heavily in agricultural research, extension, or education; and There is a lack of demand for productivity-increasing technologies.

It should be noted that the Mission emphasized that care must be exercised in interpreting the constraint that ranked second, i.e., that the country's government is unwilling to provide the funding required to cover the recurrent costs of field-level programs. Specifically, "to indicate that the GOJ is not willing to make improvements in extension, research or education is quite different than their inability due to serious financial and other constraints." In other words, the situation is not "that the GOJ won't" but rather that "the GOJ can't."

With respect to constraints internal to USAID/Jamaica, the following ranking of constraints appeared:

Rank

1 Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.

2 AID now emphasizes the private sector, rather than the public sector, as the principal means of development.

3 Mission strategy sees research, extension, and education separately rather than collectively (i.e., as being interrelated).

4 AID now encourages an export-led agricultural development strategy, rather than a food security strategy.

5 In spite of a general commitment to long-term institution-building, there is an operational push toward short-term projects having highly visible, relatively immediate impact.

Mission Strategy for Improving Agricultural REE

The Mission identified the following as the priority issues for agricultural research and education:

- Lack of budgetary support for research
- Low salaries for researchers
- Low morale among researchers
- Poor leadership
- Lack of trained (advanced degree) personnel

The following were identified as the priority issues for agricultural extension:

- Effectiveness of technologies being extended
- Agricultural productivity
- Sorting out institutional issues of implementation

The Mission's strategy/plan is to address these issues as follows:

Research: Fund research via JARP (532-0128), support long- and short-term training, and support adoption of Administrative Reform Program to enhance salaries. Extension: There is no overall strategy, rather project-based strategies. Education: Through project 532-0082 and other education projects, the Mission expects to increase the number of trained persons available to the sector. There is no specific strategy for agricultural education. However, the Mission plans to identify, develop, and implements projects involving all three

functions. The Mission noted that: "A strategy is evolving which expects to strengthen major aspects of private sector agricultural development, develop public sector natural resource management capabilities and support public and private sector agricultural initiatives toward greater productivity."

Management Questions Facing the Mission

The Mission indicated that the ARDO

> does not consider the problem of support for ag research, extension or education as a management/operational problem but rather a strategic policy one. The important questions are 'What is needed in Jamaica for agriculture to prosper?' 'What constraints can be reduced or eliminated through projects?' 'What support can or will the GOJ provide to what kind of projects: education, research and/or extension?"

In the Mission's view, "Mission management questions arise after the policy questions have been answered and the strategy established, i.e., how many DHs, FSNs and/or PSCs will it take to manage the portfolio?" But the Mission indicated that comprehensive economic studies are needed to determine the importance of agriculture in the Jamaican economy.

Opportunities to be Pursued

The Mission noted that AID should pursue opportunities to develop degree training, information networks, and legal mechanisms for returning extension, research, and education professionals. (Opportunities for other donors were not identified.)

Program-Level Performance Monitoring System

The Mission indicated that its agricultural strategy focuses on two areas: increasing exports and employment and raising incomes of farmers while conserving fragile lands. The Mission indicated that while it does not have an ARD program-level M&E plans, the Mission does have projects in the Ag REE category. However, these projects, the Mission noted, are not generating the kind of data necessary for a program-level M&E plan.

Annex: <u>Constraints to Ag REE-Strengthening in Jamaica</u>

In rating constraints internal to the public sector and constraints internal to the USAID Country Mission, USAID/Jamaica provided separate ratings for research, extension, and education. This Annex describes the procedures followed to convert these separate ratings for research, extension, and education into a combined rating, in order to allow comparison of the Mission's ratings to those provided by the other USAID Missions.

A. Internal to Public Sector Organizations

The following summarizes the separate ratings provided by USAID/Jamaica for constraints internal to public sector organizations for research, extension, and education

Agricultural Research—All six factors were rated as at least "somewhat a constraint," and two were rated as a "major constraint" weakness of public agricultural organizations and the difficulty of reforming them; and government unwillingness to provide the funding required to cover the recurrent costs of field-level programs.

Agricultural Extension—A rating of "somewhat a constraint" was given to three factors—that Jamaica is too small to support a public sector extension effort; weakness of public agricultural organizations and the difficulty of reforming them; and government unwillingness to provide the funding required to cover the recurrent costs of field-level programs.

Agricultural Education—Only two factors were rated. A rating of "major constraint" was assigned to the weakness of public agricultural organizations and the difficulty of reforming them, while a "somewhat a constraint" rating was assigned to the statement that Jamaica lacks qualified human resources to carry out a sustained program to develop a public agricultural education organization.

These separate ratings were summed across functional areas, ranked, and weighted to provide a basis for comparing Jamaica with the other three AID-assisted Caribbean Region countries. Table D.1. presents the ranking of constraints internal to REE organizations in Jamaica. Based on the Mission's functionally-specific ratings, Table D.2. presents the ranking of constraints internal to public sector organizations (note some constraints tied). If we assign a rating of 3 ("major constraint") to the two highest ranked factors and a rating of 2 ("somewhat a constraint") to the two lowest ranked factors, this provides a basis for including Jamaica (6 constraints, weighted score, 14) in the overall ranking of AID-assisted Caribbean Region countries.

Overall, a "somewhat a constraint" rating was assigned by the Mission to each of the factors, with two factors rated as a "major constraint"—weakness of public agricultural organizations and the difficulty of reforming them; and government unwillingness to provide the funding required to cover the recurrent costs of field-level programs.

Table D.1. Ranking of Constraints Internal to Public Sector Agricultural REE Organizations in Jamaica.

Summed Weight	Rank	Assigned Weight	Constraint
8	1	3	b. Public agricultural organizations are weak and the problems of reforming them are too difficult to solve.
5	2	3	c. Unwillingness of the country's government to provide the funding required to cover recurrent costs of field-level programs (e.g., farm-level trials).
4	3		Tie between:
		2	a. Host country is too small to support a public agricultural REE effort; and
		2	d. Jamaica lacks qualified human resources to carry out a sustained program to develop public sector agricultural REE organizations.
2	4		Tie between:
		2	e. Jamaica's government fails to see any benefit in investing more heavily in agricultural REE; and
		2	f. There is a lack of demand for productivity-increasing technologies.
		14	Weighted Sum

Function	Mission Rating of Constraint a	b	c	d	e	f
Research	2	3	3	2	2	2
Extension	2	2	2	1	1	1
Education	1	3	1	2	1	3
Summed Weight	4	8	5	4	2	2

Note: The Mission emphasized that care must be exercised in interpreting the constraint that ranked second, i.e., that the country's government is unwilling to provide the funding required to cover recurrent costs of field-level programs. Specifically, "to indicate that the GOJ is not willing to make improvements in extension, research or education is quite different than their inability due to serious financial and other constraints." In other words, the situation is not "that the GOJ won't" but rather that "the GOJ can't."

Table D.2. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to Public Sector Organizations.

Key 3 = Major Constraint; 2 = Somewhat a Constraint

Constraint[1]	Jamaica	Haiti	Dom.Rep.	RDO/C	Avg.	Rank
a. Small Country Size	2	3		3	2.67	2
b. Weak Public Sector	3	3	3		3.00	1
c. Govt. Not Willing Fund REE	3	3	3		3.00	1
d. Lack Human Resources	2			2	2.00	3
e. Govt. Not See Benefit of Invest in REE	2	2	3	2	2.25	4
f. Lack of Technology Demand	2	2			2.20	5
Total	14	13	9	7		
Average	2.3	2.6	3.0	2.3	2.52	
Rank	3	2	1	3		

[1]Based on the sum of the ratings of Missions responding to each factor, divided by the number of Missions rating the factor as a "major constraint" (3) or "somewhat a constraint" (2).

B. Internal to USAID/Country Mission

Jamaica's weighted score is based on a summary of USAID/ Jamaica's separate ratings for research, extension, and education (Table D.3.). Briefly, these separate ratings were as follows:

Agricultural Research—four factors were rated as "somewhat a constraint," as follows:

- In spite of a general commitment to long-term institution-building, there is an operational push toward short-term projects having highly visible, relatively immediate impact.
- AID now emphasizes the private sector, rather than the public sector, as the principal means of development.
- Mission strategy sees research, extension, and education separately rather than collectively (i.e., as being interrelated).
- Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.

Agricultural Extension—three factors were rated as "somewhat a constraint," as follows:

- AID now emphasizes the private sector, rather than the public sector, as the principal means of development.
- Mission strategy sees research, extension, and education separately rather than collectively (i.e., as being interrelated).
- Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.

Agricultural Education—three factors were rated; identified as a "major constraint" were the following:

- AID now encourages an export-led agricultural development strategy, rather than a food security strategy.
- Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.

Rated as "somewhat a constraint" was the statement that AID now emphasizes the private sector, rather than the public sector, as the principal means of development.

Table D.3. Ranking of Constraints Internal to USAID/Country Mission in Jamaica.

Summed Weight	Rank	Assigned Weight	Constraint
7	1	3	f. Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.
6	2	3	b. AID now emphasizes the private sector, rather than the public sector, as the principal means of development.
4	3	2	e. Mission strategy sees research, extension, and education separately rather than collectively (i.e., as being interrelated).
3	4	2	c. AID now encourages an export-led agricultural development strategy, rather than a food security strategy.
2	5	2	a. In spite of a general commitment to long-term institution-building, there is an operational push toward short-term projects having highly visible, relatively immediate impact.
		12	Weighted Sum

	Mission Rating of Constraint						
Function	a	b	c	d	e	f	g
Research	2	2	1	1	2	2	1
Extension	1	2	1	1	2	2	1
Education	1	2	3	1	1	3	1
Summed Weight	2	6	3	0	4	7	0

These separate ratings were summed across functional areas, ranked, and weighted, to provide a basis for comparing Jamaica with the other three AID-assisted Caribbean Region countries. Based on the Mission's functionally specific ratings, Table D.4. presents the ranking of constraints internal to USAID/Country Mission. If we assign a rating of 3 ("major constraint") to the two highest ranking factors and a rating of 2 ("somewhat a constraint") to the three lowest ranking factors, this provides a basis for including Jamaica (5 constraints, weighted score, 12) in the overall ranking of Caribbean Region countries.

Overall, two factors were rated as a "major constraint"—AID's emphasis on the private sector, rather than the public sector, as the principal means of development; and Mission does not have a strategy to get the REE functions working in a coordinated manner. Three factors were identified as "somewhat a constraint"—an operational push toward short-term projects having highly visible, relatively immediate impact (in spite of a general commitment to long-term institution-building); AID strategy emphasizing export-led agricultural development rather than food security; and Mission strategy sees REE separately rather than collectively. Table D.4. provides the Mission's own ratings on each of three REE functions.

Table D.4. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to USAID/Country Mission.

Key 3 = Major Constraint; 2 = Somewhat a Constraint

Constraint[2]	Haiti	Jamaica	Dom.Rep.	RDO/C	Avg.	Rank
a. Push toward Short-Term Projects	2	2			2.00	4
b. Private Sector Emphasis	2	3	2	2	2.25	3
c. Export-Led Development Strategy	2	2	2	2	2.00	4
d. Push toward Natural Resources	2	-	-	-	2.00	4
e. Mission Sees REE Separately	3	2	-	-	2.50	2
f. Mission Lacks REE Coordination Strategy	3	3	-	-	3.00	1
g. Mission Lacks Adequate Staff to Deal w/ REE	-	-	3	-	3.00	1
Total	14	12	7	4		
Average	2.8	2.4	2.3	2.0	2.39	
Rank	1	2	3	4		

[2]Based on the sum of the ratings of Missions responding to each factor, divided by the number of Missions rating the factor as a "major constraint" (3) or "somewhat a constraint" (2).

USAID REGIONAL DEVELOPMENT OFFICE FOR THE CARIBBEAN (RDO/C)

It should be noted that the Mission's replies, as summarized in this case study, apply to a set of small island countries in the Eastern Caribbean, including Antigua, Dominica, Montserrat, St. Kitts-Nevis, St Lucia, and St. Vincent.

Current & Planned Projects

The Mission identified two projects with components aimed at improving agricultural research, extension, or education. The Caribbean Agricultural Research and Extension (538-0164) project is being implemented by the Caribbean Agricultural Research and Development Institute (CARDI). The West Indies Tropical Produce Support (538-0163) project is being implemented by the Organization of Eastern Caribbean States (OECS) and CARDI.

Non-Project Assistance

The Mission indicated that it does not have a position on the possibility of using non-project assistance (i.e., policy dialogue coupled with ESF- and/or PL-480-generated local currency) to stimulate change in (1) public sector resources allocated to agricultural research, extension, and education institutions; or (2) governmental policies and programs relating to agricultural research, extension, and education institutions.

Progress of Public Agricultural Research Organizations

The Mission noted "much" progress in 3 (17%) of the 18 categories, including mobilizing support for agricultural research from the public sector, improving the internal organization and management of public sector agricultural research organizations, and developing on-farm trials as an integral part of an adaptive research program. On the other hand, a rating of "no" progress was assigned to four categories, including mobilizing support for agricultural research from the private sector and adapting technology for the production of traditional export crops, trees, and fisheries/aquaculture. In between these two extremes, a rating of "some" progress was assigned to 11 (61%) of the categories.

Progress of Public Agricultural Extension Organizations

A rating of "much" progress was assigned to 7 (44%) areas, while a rating of "some" progress was assigned to the balance of the areas. The areas achieving "much" progress are:

- Establishing a clear purpose statement—what organization does, who its serves, how it operates, how financed, and how evaluated.
- Identifying and making use of indigenous knowledge of farmers.
- Maintaining a client-oriented approach, with emphasis on farmer participation in planning, execution, and evaluation, including involving all farm family members in culturally acceptable ways.

- Employing extension workers close in social distance to clients, and increasing their communication and organizational skills.

- Making extension workers competent in technical subjects and diagnostic skills under farm and field conditions.

- Using a variety of methods for communication and instruction, selected on the basis of audience, objectives, and circumstances.

- Maximizing use of mass media to generate interest, provide timely information, and recognized successful performance.

Progress of Agricultural Education Organizations

The Mission reported "much" progress in four (25%) of the 16 categories:

- Developing or modifying agricultural education curricula to address identified manpower requirements.

- Developing experiential ("learning by doing") approaches and incorporating them into the educational curricula.

- Developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation.

- Providing up-to-date text books and learning materials in the country's principal language of instruction.

While a "no" progress rating was assigned to developing training programs in agricultural research management and organization, "some" progress was achieved in 9 (59%) of the categories.

Progress of TG&T Via Private Organizations

The Mission reported "some" progress in 5 (28%) of the 18 categories—getting the private sector involved in identifying research problems and setting research priorities, mobilizing research support from the public sector, participating in national and regional research networks, adapting technology for the production of traditional export crops, and strengthening collaboration with agricultural extension organizations. On the other hand, "no" progress had been achieved with respect to 7 (39%) of the categories, including mobilizing research support from the private sector, obtaining technology from appropriate regional or international networks, adapting technology for the production of a range of commodities (import substitution crops, non-traditional export crops, trees, and fisheries/aquaculture), and strengthening collaboration with education organizations.

Adequacy of Public Agricultural Research Organization

While the adequacy of the agricultural research budget overall and for equipment/supplies were rated "average" and " "good," respectively, the adequacy of the budget for salaries and per diem was rated "very good." In terms of the adequacy of the numbers of training personnel, a rating of "good" was assigned at the technical M.Sc.- and B.Sc.-equivalent levels, while a rating of "average" was assigned to the technical Ph.D.-level and to the two-year vocational school equivalent and administrative personnel levels. Generally, the adequacy of research personnel administration and research management systems was rated as "good," although a lower rating of "average" was assigned to merit promotion and program planning.

Adequacy of Public Agricultural Extension Organization

In terms of extension performance, the quality of extension advise was rated as "good," while the other two measures (% of farmers reached by extension and farmer rating of extension) were rated as "average." Generally, the adequacy of the budget was rated as "average" on all measures. Similarly, an "average" rating was assigned to the adequacy of the numbers of trained personnel, except that a lower rating of "poor" was assigned to the technical M.Sc.- and B.Sc.-equivalent levels. All aspects of the adequacy of research personnel administration and research management systems were rated as "average," except that personnel evaluation was rated as "poor."

Mission Funding for Agricultural TG&T Organizations

With respect to private agricultural TG&T, the Mission did not allocate any project funding during the 1980s; according to the Mission, "the few private organizations which exist in the region for this purpose have adequate funding. On the other hand, the Mission increased funding during the 1980s for public agricultural research and extension and for agricultural education. The Mission's rationale for these funding increases were stated as follows:

> Public Research: "The Mission strongly supports technology generation as a means to increase productivity and incomes of farmers in the region. The regional public sector organization was showing some success but required additional strengthening."
>
> Public Extension: "The Mission recognized that technology generated needed assistance to reach most farmers. The Mission also recognized that national extension services required strengthening if they were to play a significant role in the transfer process."
>
> Agricultural Education: "The Mission believes that educational institutions in the region play a critical role in 'backstopping' extension and research. Therefore, we are providing funds to help these institutions upgrade and maintain the capabilities of extensionists and researchers."

Progress of Current Mission Projects

The Mission rated Agricultural Research and Extension (538-0164) as having made "some" progress in improving technology generation, technology transfer, and agricultural education by public research, public extension, and agricultural education organizations, respectively. The Mission indicated that it is yet too early to assess the impact of the West Indies Tropical Produce Support (538-0163) project on public agricultural research and extension.

Constraints Internal to Public Sector Organizations

The only constraint identified as a "major constraint" was that of the host countries in the Eastern Caribbean being too small to support a public sector agricultural research, extension, and education effort. Two factors were rated as being "somewhat a constraint"—the Eastern Caribbean countries have a shortage of qualified human resources to carry out a sustained program to develop public sector agricultural research, extension, and education organizations; and the Eastern Caribbean country governments fail to see any benefit in investing more heavily in agricultural research, extension, and education.

Constraints Internal to USAID/Country Mission

Two factors were rated as being "somewhat a constraint": (1) AID now emphasizes the private sector, rather than the public sector, as the principal means of development; and (2) AID now encourages an export-led agricultural development strategy, rather than a food security strategy.

Mission Strategy for Improving Agricultural REE

The Mission identified the following as the priority issues relative to improving agricultural research, extension, and education in the Eastern Caribbean:

1. Greater integration of research and extension;
2. More core funding for research and extension;
3. Mechanisms for research priority setting; and
4. Professionalizing extension services.

The Mission indicated that its strategy is "to strengthen the capability of a regional research institute to carry out farming systems research and to strengthen the capability of a regional extension/education organization to backstop national extension systems. Mission strategy also calls for strengthening the linkages between research and extension." Toward implementing this strategy, the Mission plans to identify, develop, and implement projects involving research, extension, and education.

The rationale underlying this strategy is that no national organizations exist and it would not be cost effective to establish such organizations. Also, strengthening the regional extension/education entity means that the required "backstopping will go on long after our

project has ended." Finally, the establishment of linkages "should ensure that technology is transferred and that farmers and extensionists participate in [setting] research priorities."

Management Questions Facing the Mission

The Mission indicated that it currently does not have any important management questions regarding research, extension, and education. "The Mission decided recently to maintain support and to concentrate [on] non-traditional export crops."

Opportunities to be Pursued

The Mission did not identify any opportunities to be pursued by AID, stating that: "We are doing as much as we can." The Mission identified the following as opportunities to be pursued by other donors: "small ruminant research and extension. Endowments for public research. Private sector extension. Working with farmers groups, input suppliers, etc."

Program-Level Performance Monitoring System

The goals of the Mission's ARD portfolio are to:

- Maintain and to the extent possible raise incomes and food consumption of the rural poor.
- Stabilize foreign exchange earnings/savings from agriculture.
- Maintain and enhance the natural resource base.

The Mission indicated that it does not have an ARD program-level M&E plan.

Additional Considerations

The Mission indicated that its agricultural portfolio is "very new. Two projects which have been implemented for relatively short periods of time are both developing management information systems. Data from these systems will be used to monitor and evaluate achievement of Ag. strategy goals and objectives."

USAID/BELIZE

Current & Planned Projects

Two projects have components aimed at improving agricultural research and extension. The Livestock Development (505-0006), Commercialization of Alternative Crops (505-0008) and Toledo Agricultural Marketing (505-0016) projects each provide support to improve technology generation and transfer via public and private agricultural research organizations. These projects also provide support to improve agricultural education.

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions or in governmental policies and programs relating to agricultural research, extension, and education institutions, the Mission responded that it "would use non-project assistance to stimulate changes in [these areas] when USAID/Belize and [the Government of Belize] agree to the use of these resources for... assistance [in these areas]." The Mission noted that it does not currently have ESF funds for these purposes nor does it have a PL-480 program.

Progress of Public Agricultural Research Organizations

The Mission noted "much" progress in 6 (17%) of the 18 categories, including getting the private sector involved in identifying agricultural research problems and setting research priorities, developing on-farm trials as an integral part of an adaptive research program, and adapting technology for the production of traditional export crops. While "no" progress has been made in mobilizing support for agricultural research from the public or private sectors, "some" progress had been achieved in the balance (13 or 73%) of the areas.

Progress of Public Agricultural Extension Organizations

The Mission indicated that "some" progress has been made in each of the 16 areas.

Progress of Agricultural Education Organizations

The Mission indicated that Belize does not have a "traditional land-grant" type agricultural institution. However, Belize does send students to the University of the West Indies (UWI) for many of the country's manpower needs. Accordingly, the Mission's comments to this section of the questionnaire relate to institutions such as the Belize College of Agriculture at Central Farm, which is best described as a post high school 3-year agricultural program. Regarding the Belize College of Agriculture, the Mission reported "some" progress in 12 (75%) of the 16 areas, with "no" progress being noted in three areas—shifting from an emphasis on dispensing facts to passive students to an emphasis on problem-solving and developing learning, research, and management competencies; developing strategic

planing as a management tool; and developing the university's links with worldwide sources of agricultural knowledge.[1]

Progress of TG&T Via Private Organizations

The Mission reported that "no" progress has been made in four (22%) of the 18 areas—mobilizing research support from the public sector; participating in Collaborative Research Support Programs (CRSPs); and adapting technology for the production of non-traditional export crops and trees. On the other hand, "much" progress was reported in 3 (17%) categories—getting the private sector involved in identifying research problems and setting research priorities; developing on-farm trials as an integral part of an adaptive research programs; and adapting technology for the production of traditional export crops. The balance of the areas (11 or 61%) were rated as having achieved "some" progress.

Adequacy of Public Agricultural Research Organization

The Mission indicated that, on "average," there were adequate numbers of trained technical personnel at the M.Sc.- and B.Sc. levels and at the 2-year vocational school equivalent. But the adequacy of the number of trained Ph.D.-level technicians was rated as "poor." The balance of the criteria were rated as being "poor," except that the overall adequacy of the budget was rated as "very Four aspects of the adequacy of the research budget and the adequacy of the system of personnel recruitment were rated as "very poor."

Adequacy of Public Agricultural Extension Organization

With two exceptions, all aspects of public sector agricultural extension were rated as "poor," the exceptions being that the adequacy of the numbers of trained Ph.D.- and M.Sc.-level technicians was rated as "very poor," while the adequacy of the numbers of trained B.Sc. equivalent and 2-year vocational school equivalent personnel was rated as "average." An "average" rating was also assigned to the category of "% of farmers reached by extension," with the other two performance indicators (quality of extension advice and how farmers rate extension) being rated as "poor."

Mission Funding for Agricultural TG&T Organizations

Because USAID/Belize began operations only in January 1983, it was not possible for the Mission to assess a trend in funding in the 1980s. However, the Mission noted that it did allocate some funding for all four areas, except that only "very little" funding was allocated to agricultural education. The Mission indicated that agricultural education is not a Mission priority. Given the limited funding in the Mission portfolio, some support has been provided to the Belize Institute of Management and other institutions to strengthen the capability of

[1]The Mission did not reply to item (e), i.e., developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation, indicating by a question mark ("?") that the Mission was not sure how to interpret this item.

these institutions to offer training in management and technical skills essential for an expanding private sector.

Progress of Current Mission Projects

Generally, the Mission indicated that it is "too early" to assess the progress of the Toledo Agricultural Marketing project. The Livestock Development and Commercialization of Alternative Crops projects were rated as having made "much" progress in improving technology generation and transfer through private organizations. The former project was rated as having made "some" progress but the latter "no" progress in improving agricultural education, with the same pattern holding with respect to improving technology transfer via public agricultural extension organizations. The Commercialization of Alternative Crops project was rated as having achieved "some" progress in improving technology generation in public agricultural research organizations.

Constraints Internal to Public Sector Organizations

One of the six factors was rated as a "major constraint": host country is too small to support a public sector agricultural research, extension, and education effort. While the Mission assigned a "somewhat a constraint" rating to the statement that the public agricultural organizations are weak and the problems of reforming them are to difficult to solve, the Mission indicated that "it's not a case of reforming them; it's a matter of having enough financial resources to perform all the traditional services." Similarly, the Mission indicated lack of qualified human resources as being "somewhat a constraint," the Mission noted that the problem is that the public sector is not able to keep qualified personnel because of "low salaries/rewards/incentives." While noting as "somewhat a constraint" that the "government fails to see any benefit in investing more heavily in agricultural research, extension, and education," the Mission indicated that "fails" is the "wrong word," since "there are priorities given scarce resources."

Constraints Internal to USAID/Country Mission

The Mission indicated as being "somewhat a constraint" that there is an operational push in AID toward short-term projects having highly visible, relatively immediate impact. None of the other statements were indicated as being a constraint. The Mission indicated that it has emphasized the private sector "from Day 1 when Belize became a Mission." Further, the Mission stated that it is developing projects that maintain a "harmony" between production-oriented sustainable agriculture and conservation-oriented natural resource management.

Mission Strategy for Improving Agricultural REE

The Mission indicated that "the private sector will have to carry the larger role and that efforts should be made to ensure private sector institutions, particularly as related to Research/ Extension, [are] incorporated into the various programs supported by donors." At the higher education level,

more encouragement should be made to ensure Belize as a CARICOM nation participates more fully in University of West Indies programs. It's not logical for Belize to have a comprehensive agricultural education system at the B.S. to Ph.D. level. Simply cannot afford—and in a country of less than 200,000—it is not justifiable.

The Mission plans to focus on "selective targets of opportunities evolving around non-traditional agricultural exports, natural resource management and protection, and tourism." The Mission indicated that its strategy/plan does not include projects to address any of three REE functions. The rationale for this strategy is that the Mission plans to integrate the REE functions into any new projects on a "case-by-case basis which could contain 1, 2, or 3 of the functions for support in any given new activity." The Mission cites as examples: research and development in non-traditional export crops; extension in natural resource management activities. However, "if you are suggesting straight line traditional institution building projects aimed at improving the REE functions, it is not in the cards! Again, REE for any project could emphasize one function more than the other, depending on the level and need."

Management Questions Facing the Mission

The Mission indicated that agriculture and tourism are the two areas in which growth potential is the greatest. Without good long-term planning and management, these are the areas that can pose the greatest threats to tropical forests, the barrier reef, and greatest biodiversity left in Central America. The Mission stated that it "envisions a greater responsibility of R&D as part of the private sector (which is already moving in that direction) and government basically addressing 'regulatory' functions."

The Mission indicated that ways need to be identified to help the Government of Belize to develop its capacity to rationally plan and manage resources effectively to guide economic growth, while continuing to address constraints to growth such as infrastructure, managerial skills, and a narrow export product base. Also, there is a need to identify how to maximize job creation, government revenue, and protection of the resource base.

Opportunities to be Pursued

The Mission noted the need for AID to continue and expand current programs to identify, promote, and market export crops through the private sector. Two other areas meriting attention are forestry and fisheries production and export which includes improving fishing conservation policies and compliance.

Other donors should address the problems of infrastructure (e.g., roads/port facilities) and credit. However, the U.S. is the leading donor in Belize.

Program-Level Performance Monitoring System

The goals of the Mission's ARD portfolio are to increase agricultural production, improve natural resource management, strengthen the private sector, and promote exports.

While the Mission does not have an ARD program-level M&E plan, the Mission indicated that each Project Paper contains an M&E plan for that project.

Additional Considerations

The Mission added that, in "preparing [its] responses [to the survey questionnaire], one almost gets the feeling that someone is trying to recapture another era that essentially is not reflective of today's scene."

> Like many Missions, there is no longer (except perhaps in name only) where an Ag or Rural Development Office confines itself to all the traditional Ag/RD projects. Natural Resource Management/Environment, non-government or private sector activities as in the case of Belize are part of the Ag portfolio. The historic REE approach of having straight forward institution building projects as the cornerstone of the ADO portfolio [is] not as prevalent as [it was] even 5 years ago. Yet, many of the principles/processes for using REE are as important to developing natural resource management/environmental/private sector activities as they [are] to traditional production programs of agriculture.

USAID/COSTA RICA

Current & Planned Projects

The Mission identified two projects with components aimed at improving agricultural research, extension, or education: NTAE Technical Support (515-0237), being implemented by the private Costa Rican Coalition for Development Initiatives (CINDE); and Northern Zone Consolidation Project (515-0235), implemented by the Ministry of Planning. The Mission reported that neither project has an M&E plan.

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions, the Mission reported that it no longer emphasizes agricultural research or education and that preference is given to private extension services (there are nine such private extension services in Costa Rica) rather than public mechanisms.

With regard to using non-project assistance to stimulate change in governmental policies and programs relating to agricultural research, extension, and education institutions, the Mission reported that it does not have a position on this issue and that these ares are not priority areas in Costa Rica.

Progress of Public Agricultural Research Organizations

The Mission noted "some" progress in 6 (33%) of the 18 categories, including getting the private sector involved in identifying agricultural research problems and setting research priorities, participating in national and regional research networks, and participating in Collaborative Research Support Programs (CRSPs). Also, "some" progress was noted in adapting technology for production of traditional export crops, import substitution crops, and trees.

In the balance (12 or 67%) of the areas, the Mission reported that "no" progress has been made in improving agricultural technology generation in public agricultural research organizations. The Mission noted that "private agricultural research has by far overshadowed the [limited] efforts of the University of Costa Rica and CATIE...to provide new production and marketing means."

Progress of Public Agricultural Extension Organizations

All 16 (100%) of the categories were rated by the Mission as having experienced "no" progress with respect to improving the capability of public agricultural extension organizations to carry out agricultural technology transfer.

Progress of Agricultural Education Organizations

All 16 (100%) of the categories were rated by the Mission as having experienced "no" progress with respect to improving the capability of agricultural education organizations to carry out agricultural education.

Progress of TG&T Via Private Organizations

The Mission reported "much" progress in 6 (33%) and "some" progress in 6 (33%) of the 18 categories. Areas in which "much" progress has been made are: getting the private sector involved in identifying research problems and setting research priorities, mobilizing research support from the private sector (i.e., private funding), developing on-farm trials as an integral part of an adaptive research program, and adapting technology for export crops to meet farmer growing conditions and market opportunities. The rating of "much" progress also was assigned to adapting technology for traditional export crops, import substitution crops, and non-traditional export crops.

Areas of "some" progress has been made are: mobilizing research support from the public sector (i.e., government funding), improving the internal organization and management of private sector research organizations, improving the quality of the scientific and support staff of private sector research organizations, obtaining technology from appropriate regional or international sources, strengthening collaboration with agricultural extension organizations, and adapting technology for the production of livestock.

The Mission noted that most university professors work part-time on retainer to private extension services. With respect to strengthening collaboration with agricultural education organizations, the Mission noted that the host country had not sought to make progress in this area and that most industries train their own people. Also identified as areas in which the host country private organizations had not sought to make progress were (1) participating in national and regional research networks, and (2) participating in Collaborative Research Support Programs (CRSPs), neither of these being seen by the private sector as useful.

Adequacy of Public Agricultural Research Organization

Only two areas (adequacy of budget for urban-based technical personnel and administrators) were rated as high as "average," while the adequacy of budget for field-based technical personnel was rated as "poor." All other aspects—adequacy of budget, adequate numbers of trained personnel, and adequacy of research administration and management—of the public sector agricultural research organizations were rated as "very poor," with the adequacy of budget for equipment/supplies and the adequacy of merit promotion systems being even less.

Adequacy of Public Agricultural Extension Organization

The same response pattern provided by the Mission for the adequacy of the public agricultural research organization was also given for the adequacy of the public agricultural extension organization. In terms of performance criteria, both the quality of extension advise and farmer rating of extension were rated by the Mission as "very poor," although the percent of farmers reached by extension was rated as "average."

Mission Funding for Agricultural TG&T Organizations

During the 1980s, the Mission terminated project funding to improve technology generation by public agricultural research organizations and to improve technology transfer via public agricultural extension organizations. The Mission's rationale for such termination was that the Ministry of Agriculture "is highly politicized, oriented towards maintenance of subsidized production, and failed the RIG [Regional Inspector General] pre-award accounting audit." Further, the Mission allocated no project funding for improving agricultural education, the rationale for this being that agricultural education is "not considered a priority, either in Mission or in AID/W."

However, the Mission increased project funding to improve agricultural TG&T through private organizations. As explained by the Mission, the rationale was to fill "the public sector vacuum with private sector solutions."

Progress of Current Mission Projects

The Mission reported that neither the NTAE Technical Support (515-0237) nor Northern Zone Consolidation Project (515-0235) projects had made any progress with respect to improve technology generation and transfer by public research and extension organizations. However, "some" progress has been made by these projects with respect to agricultural TG&T transfer through private organizations.

Constraints Internal to Public Sector Organizations

The Mission noted two constraints with respect to improving agricultural research, extension, and education within public sector organizations. A "major constraint" rating was assigned to the status of public agricultural organizations being week and the problems of reforming them being too difficult to solve, while a rating of "somewhat a constraint" was assigned to the unwillingness of the host country government to provide the funding required to cover the recurrent costs of field-level programs.

Constraints Internal to USAID/Country Mission

Only one factor was identified as a constraint, and this was identified as a "major constraint": In spite of a general commitment to long-term institution building, there is an operational push toward short-term projects having highly visible, relatively immediate impact.

Mission Strategy for Improving Agricultural REE

The Mission indicated that there is "no perceived need for bilateral projects in these areas" and that the Mission is "phasing this part of the portfolio to zero. No new obligations are planned through FY 93." Hence there is no Mission strategy or plan with respect to improving agricultural research, extension, and/or education in Costa Rica.

Management Questions Facing the Mission

The Mission responded to this question as not applicable.

Opportunities to be Pursued

The Mission identified no opportunities that should be pursued by AID With respect to opportunities that should be pursued by other donors, the Mission commented that "preference should be given to privately managed operations, but that's unlikely to occur in the policy environment which seems perennial in the sector."

Program-Level Performance Monitoring System

On the declining side of the Mission's portfolio, the goals are to raise rural incomes in selected poverty-prone areas, while the goal on the increasing side of the portfolio is to help decrease the rate of natural resource consumption, destruction, and overuse in the medium term. However, the ARD Office does not have an ARD program-level M&E plan and has taken no steps to develop an M&E system to track performance of the Mission's project portfolio vis-a-vis the aforementioned ARD goals.

Additional Considerations

The Mission states:

> Costa Rica is anomalous in its high per capita income and its high literacy rate. Therefore, private sector solutions have been easier to implement than in other, less advanced countries. The AID program in Costa Rica is declining rapidly in funds, resulting in a much reduced portfolio and the resulting focus on only natural resource management.

USAID/EL SALVADOR

Current & Planned Projects

Several current and planned projects have components aimed at improving agricultural research, extension, or education. Water Management (519-0303) is providing support for technology generation in both the public and private sectors as well as for agricultural education. Support for agricultural education also is provided by Agribusiness Development (519-0327) and will be provided by Coffee Technology Enhancement (519-0362). Other projects containing a research, extension, or education component are: LC-Sustainable Agriculture, Community Based Rural Development (519-0364), and Technoserve Rural Enterprise Development (519-0382). Planned projects with research, extension, or education components are Commercial Farming (519-0351) and Sustainable Agriculture (519-0374). Some projects are implemented by a public agency, others by private firms, and some provide for a mix of public and private participation.

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions, the Mission encourages the Government of El Salvador (GOES) to allocate ordinary budget resources to support public sector agricultural institutions. At the same time, selected activities such as natural resources management and the Agrarian Reform are supported with local currency generations from ESF and PL-480 Title I. The Mission also includes self help measures in the PL-480 agreement to upgrade agricultural research, extension, and education institutions. With regard to using non-project assistance to stimulate change in governmental policies and programs relating to agricultural REE institutions, the Mission engages the GOES in policy dialogue and includes self help measures in PL-480 agreements pertaining to policies and programs for agricultural research, extension, and education.

Progress of Public Agricultural Research Organizations

The Mission noted "some" progress in 6 (33%) of the 18 categories, including getting the private sector involved in identifying agricultural research problems and setting research priorities and mobilizing support for agricultural research from the private sector. Some progress also has been made in obtaining technology from regional and international sources and participating in national/regional research networks and in Collaborative Research Support Programs (CRSPs).

While "some" progress has been made in developing on-farm trials as an integral part of adaptive research, the Mission noted that "no" progress has been made in terms of adapting technology for production of staple food crops, livestock, traditional export crops, trees, or fisheries/aquaculture. Import substitution crops and non-traditional export crops were identifies as areas in which the host country had not sought to make progress through public agricultural research organizations.

Other areas in which "no progress" was identified as having been made were mobilizing public funding for research, improving the internal organization and management of public agricultural research organizations, improving the quality of the scientific and support staff of such organizations, and collaborating with agricultural extension and education organizations.

Progress of Public Agricultural Extension Organizations

Only three (19%) of 16 categories were identified as having made "some" progress—drawing upon research-based technologies to extend technology tested as appropriate for specific site and farmer circumstances, making extension workers competent in technical subjects and diagnostic skills under farm and field conditions, and improving extension workers' skills to conduct on-farm trials. The balance (81%) of the categories were rated as having had "no" progress.

Progress of Agricultural Education Organizations

The Mission reported "some" progress in only one (6%) of the 16 categories—developing experiential ("learning by doing") approaches and incorporating them into the educational curricula. The balance (94%) of the categories were rated as having had "no" progress.

Progress of TG&T Via Private Organizations

The Mission reported "much" progress in 4 (22%) of the 18 categories—obtaining technology from appropriate regional or international sources, developing on-farm trials as an integral part of an adaptive research program, and adapting technology for non-traditional export crops and for fisheries/aquaculture. A rating of "some" progress was made for 7 (39%) of the categories. Key areas in which "some" progress have been made are: getting the private sector involved in identifying research problems and setting research priorities, improving the internal organization and management of private sector research organizations, and improving the quality of the scientific and support staff of these organizations. A measure of "some" progress also has been made in adapting technology for import substitution crops and strengthening collaboration with extension and education organizations.

Adequacy of Public Agricultural Research Organization

Four aspects of the adequacy of the research budget—overall amount, timely availability, and adequacy for per diem and equipment/supplies—were rated as very poor, whereas the adequacy of the budget for salaries was rated only slightly better as "poor." While the adequacy of the numbers of trained technical (Ingeniero Agrónomo and Perito Agrónomo) and administrative personnel was rated as "average," the adequacy of the number of trained M.Sc.- and Ph.D.-level technical personnel was rated as "very poor."

Generally, The adequacy of administration and management systems was rated from "poor" (personnel recruitment, personnel evaluation, personnel development, and program

planning) to "very poor" (merit promotion, program budgeting, program monitoring, and program evaluation).

Adequacy of Public Agricultural Extension Organization

With few exceptions, almost all aspects of public sector agricultural extension were rated as "very poor," including the performance criteria (% of farmers reached by extension, quality of extension advise, and farmer rating of extension). Slightly more positive (still "poor") ratings were given to the adequacy of systems for recruiting, evaluating, and developing personnel and for merit promotion. The number of trained technical (Ingeniero Agrónomo and Perito Agrónomo) and administrative personnel was rated as "average," while the adequacy of the number of technical Ph.D.- and M.Sc.-level staff was rated as "very poor."

Mission Funding for Agricultural TG&T Organizations

Mission funding for agricultural REE organizations during the 1980s increased in three—public research, public extension, and agricultural TG&T through private organizations—of the four categories. No Mission funding was allocated for agricultural education. But the Mission indicated that the increment in funding for public research/extension was only "slightly."

Progress of Current Mission Projects

The Mission rated the Water Management (519-0303) as having made "some" progress in improving technology generation in public research organizations and agricultural education organizations. Both the Water Management and Agribusiness Development (519-0327) projects were rated as having achieved "much" progress with respect to technology generation and transfer through private organizations. No projects were identified as being relevant to achieving progress with respect to technology transfer via public agricultural extension organizations, while it is "too early" to assess the impact of Coffee Technology Enhancement (519-0362) on technology generation and transfer by private organizations.

Constraints Internal to Public Sector Organizations

Three (of 50%) of the six factors were rated as a "major constraint": (1) unwillingness of the GOES to provide the funding required to cover the recurrent costs of field-level programs; (2) lack of qualified human resources to carry out a sustained program to develop public sector agricultural research, extension, and education organizations; and (3) failure of the GOES to see any benefit in investing more heavily in agricultural research, extension, or education. A rating of "somewhat a constraint" was assigned to the factor of public agricultural organizations being weak and the problems of reforming them being too difficult to solve.

Constraints Internal to USAID/Country Mission

Three factors were noted as being "major constraints" to improving agricultural research, extension, and education when these functions are the responsibility of public sector organizations: (1) AID now emphasizes the private sector, rather than the public sector, as the principal means of development; (2) AID now encourages an export-led agricultural development strategy, rather than a food security strategy; and (3) in spite of a general commitment to long-term institution-building, there is an operational push toward short-term projects having highly visible, relatively immediate impact.

Mission Strategy for Improving Agricultural REE

The Mission identified the following as the priority issues relative to improving agricultural research, extension, and education in El Salvador: (1) national agricultural policy; (2) commitment to long-term funding; (3) a massive deepening of human capital; and (4) complete reorganization of agricultural REE institutions.

The Mission's strategy or plan to deal with these issues includes: (1) policy dialogue; (2) technical assistance to develop a modernization plan; and (30 some (limited) local counterpart funding for budget support. The Mission indicated that it's strategy/plan includes identifying, developing, and implementing projects including all three functions—research, extension, and education, although support would be provided on a limited basis and not necessarily through the same organization. However, the Mission indicated that the host country "must show interest in change before USAID will invest more (any) money."

Management Questions Facing the Mission

Two questions were identified: (1) Should USAID/El Salvador concentrate efforts in agricultural REE in the public sector? (2) What is the proper mix of public/private sector support? But, at this time, neither of these questions was identified as being most crucial in terms of needing study, strategy development, and/or project-related action.

Opportunities to be Pursued

The Mission noted technical assistance and training as two areas of opportunity that should be pursued by AID By comparison, opportunities for other donors relate to development of infrastructure.

Program-Level Performance Monitoring System

The goals of the Mission's ARD portfolio are to increase income and create new job opportunities. However, the Mission reported that the ARD Office does not have an ARD program-level M&E plan.

USAID/GUATEMALA

Current & Planned Projects

Three projects were identified by the Mission as having agricultural research, extension, or education components, as follows: Highlands Agricultural Development (520-0274), Agribusiness Development (520-0276), and Development Training and Support (520-0384).

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions, a greater allocation of government resources for supporting the Agricultural Science and Technology Institute (ICTA) is part of the ESF negotiations. With regard to using non-project assistance to stimulate change in governmental policies and programs relating to agricultural research, extension, and education institutions, the Mission is exploring the possibility of establishing an Agricultural Research Foundation as well as a private extension system, both as complements to the publicly supported research and extension institutions (ICTA, DIGESA, DIGESEPE).

Progress of Public Agricultural Research Organizations

The Mission identified "much" progress as having been made with respect to developing on-farm trials as an integral part of an adaptive research program and in adapting technology for the production of staple food crops and non-traditional export crops. While a total of three (17%) of the 18 categories were rated as having experienced "much" progress, 11 (61%) of the categories were rated as having made "some" progress, including getting the private sector involved in identifying agricultural research problems and setting research priorities, mobilizing support for agricultural research from the public and private sectors, obtaining technology from regional and international agricultural research organizations, participating in national and regional research networks, collaborating with agricultural extension and education organizations, and adapting technology for the production of livestock, traditional export crops, trees, and fisheries and aquaculture. The Mission indicated that the host country had not sought to make progress with respect to adapting technology for the production of import substitution crops.

Progress of Public Agricultural Extension Organizations

A rating of "some" progress was assigned to 14 (88%) of the 16 categories, with a rating of "no" progress assigned to only two categories—providing systematic follow-up and follow through with farmers who adopt new technology to identify and solve unanticipated problems and facilitate adaptations in practices, and being responsive to new problems arising from use of new technology, such as storage, utilization, and marketing.

Progress of Agricultural Education Organizations

The Mission reported "some" progress in 5 (31%) of 16 categories, as follows: developing or modifying agricultural education curricula to address identified manpower requirements; collaborating with agricultural research organizations; developing a diversified mix of funding by private, public, and international sources; developing the university's links with worldwide sources of agricultural knowledge; and providing up-to-date text books and learning materials in Spanish. On the other hand, a rating of "no" progress was made in 6 (38%) of the 16 categories, as follows: identifying the projected manpower requirements in the agricultural sector; developing experiential ("learning by doing") approaches and incorporating these into the educational curricula; shifting from an emphasis on dispensing facts to passive students to an emphasis on problem-solving and development of learning, research, and management competencies; developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation; developing non-degree short courses to meet identified training needs of various audiences in the agricultural sector; and collaborating with agricultural extension organizations.

Progress of TG&T Via Private Organizations

The Mission reported "some" progress in 10 (56%) of the 18 categories, including getting the private sector involved in identifying research problems and priorities; mobilizing research support from the public and private sectors; improving the internal organization and management of private sector research organizations; and strengthening collaboration with agricultural extension organizations. A rating of "some" progress also was assigned to adapting technology for the production of staple food crops, livestock, non-traditional export crops, trees, and fisheries and aquaculture. On the other hand, a rating of "no" progress was assigned to adapting technology for the production of traditional export crops and strengthening collaboration with agricultural education organizations. A total of 6 (33%) of the categories were identified as areas in which the host country had not sought to make progress in agricultural TG&T through private organizations, although the Mission is exploring the possibility of a private Agricultural Research Foundation.

Adequacy of Public Agricultural Research Organization

Generally, the Mission rated the public sector organization primarily responsible for agricultural research as "average" with respect to the adequacy of budget, numbers of trained personnel, and systems for research administration/management. But three areas were rated as "poor" (availability of budget on a timely basis, adequacy of budget for per diem, adequacy of the number of trained technical M.Sc.-level staff), while two areas were rated as "very poor" (adequacy of budget for equipment/supplies and adequacy of the number of trained technical Ph.D.-level staff).

Adequacy of Public Agricultural Extension Organization

Although all three performance criteria (% farmers reached by extension, quality of extension advise, and farmer rating of extension) were rated as "poor," the public sector

organization primarily responsible for agricultural extension generally received a slightly higher ("average") rating. Overall, the pattern of ratings for public extension was exactly the same as that described for public research.

Mission Funding for Agricultural TG&T Organizations

Mission funding for agricultural REE organizations during the 1980s increased in three—public research, public extension, and agricultural TG&T through private organizations—of the four categories. Under the Highlands Agricultural Development project and an earlier Agricultural Diversification project, project funding was allocated to strengthen ICTA (public research organization) and DIGESA (public extension organization). The Agri-Business Development project allocated resources for private involvement in research for non-traditional agricultural crops. Additional resources were allocated to explore the likelihood of establishing a private foundation for agricultural research. Also, a proposal has been submitted to fund a private extension system. No Mission funding was allocated for agricultural education.

Progress of Current Mission Projects

The Highlands Agricultural Development project was rated as having achieved "some" progress in technology generation and transfer via public research and extension organizations. while the Agri-Business Development project also was rated as having achieved "some" progress on agricultural TG&T through private organizations.

Constraints Internal to Public Sector Organizations

The "major constraint" identified is the failure of the government to see any benefit in investing more heavily in agricultural research, extension, or education, while a rating of "somewhat a constraint" was assigned to the unwillingness of the government to provide the funding required to cover the recurrent costs of field-level programs.

Constraints Internal to USAID/Country Mission

Three factors were rated as being "major constraints" to improving agricultural research, extension, and education when these functions are the responsibility of public sector organizations: (1) AID now encourages an export-led agricultural development strategy, rather than a food security strategy; (2) in spite of a recognized need for production-oriented sustainable agriculture, there is an operational push toward conservation-oriented natural resource management projects; and (3) Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner.

The other four factors were identified as being "somewhat a constraint," as follows: (1) in spite a general commitment to a long-term institution-building, there is an operational push toward short-term projects having highly visible, relatively immediate impact; (2) AID now emphasizes the private sector, rather than the public sector, as the principal means of development; (3) Mission strategy sees research, extension, and education separately rather

than collectively (i.e., as being interrelated); and (4) Mission does not have adequate staffing to deal effectively with agricultural REE projects.

Mission Strategy for Improving Agricultural REE

The Mission related that Guatemala has been a ("the") pioneer in farming systems research in the LAC region but that this approach has not been sustained. Nor has it benefitted from recent advances in this field. "A more coordinated effort between agricultural research, extension, and education is imperative." Also, there is a need for closer collaboration between the public and private sectors. The current Mission's plan for improving agricultural research, extension, and education "is not addressing the main issue of coordination and support. Funding has been made available to support research and extension but in an independent manner. The systems approach is being replaced by a commodity approach." The Mission's strategy is to identify, develop, and implement projects involving only research and extension. The Mission's position "reflects the skepticism for a system approach to agricultural research, extension, and education. It also reflects the current emphasis to support non-traditional agricultural exports."

Management Questions Facing the Mission

The most important question for the Mission is that of whether to reduce its support for public agricultural research institutions and to increase support for private research organizations, i.e., a private foundation for agricultural research. The Mission has received a proposal for establishing a private Foundation for Agricultural Research. Based on a review of this document, the Mission will identify areas for further study.

Opportunities to be Pursued

The opportunity that should be pursued by AID is that of how to involve the private sector in agricultural research and extension, "which will be identified once the proposal for a private Ag. research foundation is reviewed." The Mission states that other donors should pursue the opportunity of "how to strengthen public Ag. research and extension systems to enhance the effectiveness of the private sector in both areas."

Program-Level Performance Monitoring System

The goals of the Mission's ARD Office are those of: (1) increasing the income of the poor majority; (2) expanding the availability and consumption of food; and (3) maintaining and enhancing the natural resource base. The ARD Office does not have an ARD program-level M&E plan; however, each project has developed its own system, while a Mission-level M&E plan is being prepared.

USAID/HONDURAS

Current & Planned Projects

Several current projects have components aimed at improving agricultural research, extension, or education. Three projects provide support for strengthening public agricultural extension organizations: Small Farmer Coffee Improvement (522-0176), Irrigation Development (522-0268), and Land Use Productivity Enhancement (522-0292). Four projects provide support for strengthening technology generation and transfer through private organizations: Small Farmer Livestock (522-0209), Export Development and Services (522-0207), Honduran Agricultural Research Foundation (522-0249), and Small Farmer Organization Strengthening (522-0252). One project, Zamorano Scholarships (522-0314) provides support for agricultural education. The Mission currently has no projects aimed at improving public sector agricultural research. One project, Investment Development Project (522-0312) currently is being planned and was identified by the Mission as potentially including some support for agricultural REE strengthening.

Further, in addition to all of the above USAID/Honduras-funded projects, the Mission noted that it also collaborates in the centrally-funded Communication for Technology Transfer in Agriculture (CTTA) project, three Collaborative Research Support Programs (CRSPs), the RTAC textbook program, and the RENARM project. All of these are contributing to research, extension, and education activities in Honduras' agricultural sector. Also, the ASHA program has donated more than US$11 Million to Zamorano for buildings and facilities. The Mission also supports CAPS scholars who study agricultural subjects, both degree and non-degree, in the U.S.

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions, the Mission indicated that it favors the concept of "privatization" by the GOH of many agricultural research and extension activities. Mission is in the process of developing a major non-project assistance program which will be called "Agricultural Sector Adjustment Program." This program will be used to influence a wide variety of sector policies and will have a significant impact on public sector allocation of resources to research, extension, and education.

With regard to using non-project assistance to stimulate change in governmental policies and programs relating to agricultural REE institutions, the Mission indicated that its agenda is clearly directed at achieving policy reforms by developing a sectoral program that will incorporate ESF, DA, and PL-480 resources into a program combining structural adjustment and specific project-type activities. This program will work toward improving not only the allocation of resources to agricultural REE but also on how REE activities are carried out.

Progress of Public Agricultural Research Organizations

The Mission noted "some" progress in 9 (50%) of the 18 categories, including mobilizing support for agricultural research from the public sector; obtaining technology from regional and international agricultural research organizations; participating in national and regional research networks; developing on-farm trails as an integral part of adaptive research; adapting technology for the production of selected commodities (staple food crops, traditional export crops, import substitution crops, and fisheries/aquaculture); and collaborating with agricultural education organizations. Only one category was rated as "much" progress, namely, participating in Collaborative Research Support Programs (CRSPs).

A rating of "no" progress was assigned to the remaining eight categories, as follows: getting the private sector involved in identifying agricultural research problems and setting research priorities; mobilizing support for agricultural research from the private sector; improving the internal organization and management of public sector agricultural research organizations; adapting technology for the production of selected commodities (livestock, non-traditional export crops, and trees); and collaborating with agricultural extension organizations.

Progress of Public Agricultural Extension Organizations

Half (8 or 50%) of the 16 categories were rated as having made "some" progress—identifying and making use of indigenous knowledge of farmers; drawing upon research-based technologies to extend technology tested as appropriate; maintaining a client-oriented approach; locating offices and providing staff transportation to facilitate ready two-way access between farmers and extension workers; working with and through groups and community leaders to achieve efficiency and to accelerate spread of recommended technology; making extension workers competent in technical subjects and diagnostic skills under farm and field conditions; using a variety of methods for communication and instruction; maximizing use of mass media to generate interest, provide timely information, and recognize successful performance; and monitoring adoption of recommended practices, adapting these as necessary to facilitate incremental adoption by farmers.

Five (31%) categories were assigned a "no" progress rating, including establishing a clear purpose statement; providing agricultural research system with information on existing farming systems, farmer problems, and performance of present and new technology under farm-level conditions; employing extension workers close in social distance to clients and increasing their communication and organizational skills; providing systematic follow-up and follow through with farmers who adopt new technology to identify and solve unanticipated problems and facilitate adaptations in practices; and being responsive to new problems arising from use of new technology. The Mission indicated that the host country had not sought to make progress in two areas—improving extension workers' skills to conduct on-farm trials and establishing effective working links with all relevant parties (e.g., marketing agents, input suppliers, researchers, education, etc.).

Progress of Agricultural Education Organizations

The Mission provided ratings for both public and private agricultural education organizations.

Public—The Mission noted that the host country had not sought to make progress in nine (56%) categories—identifying the projected manpower requirements in the agricultural sector; developing or modifying agricultural education curricula to address identified manpower requirements; developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation; developing strategic planning (envisaging and programming for the needs of the future) as a management tool; developing flexibility for university staff to allocate and share time according to problems faced by the agricultural sector rather than the disciplines in which staff members were trained; developing training programs in agricultural research management and organization; developing non-degree short courses to meet identified training needs of various audiences in the agricultural sector; collaborating with agricultural extension organizations; and analyzing how the educational system, from primary and secondary levels through graduate/post-graduate education, is responding to the country's agricultural manpower requirements.

Further, a rating of "no" progress was assigned to four (25%) of the categories—shifting from an emphasis on dispensing facts to passive students to an emphasis on problem-solving and development of learning, research, and management competencies; getting teaching staff involved in carrying out research on problems facing the agricultural sector; developing a diversified mix of funding by private, public, and international sources; and developing the university's links with worldwide sources of agricultural knowledge.

However, a rating of "some" progress was assigned to three (19%) categories—developing experiential ("learning by doing") approaches and incorporating these into educational curricula; collaborating with agricultural research organizations; and providing up-to-date text books and learning materials in the country's principal language of instruction.

Private—A more positive picture emerges with respect to Mission support for private sector agricultural education, with
a rating of "much" progress assigned to seven (44%) categories and "some" progress also to seven (44%) categories.

The items having a "much" progress rating were: identifying the projected manpower requirements in the agricultural sector; developing experiential ("learning by doing") approaches and incorporating these into the educational curricula; collaborating with agricultural research organizations; developing non-degree short courses to meet identified training needs of various audiences in the agricultural sector; developing a diversified mix of funding by private, public, and international sources; developing the university's links with worldwide sources of agricultural knowledge; and providing up-to-date text books and learning materials in the country's principal language of instruction.

The items receiving a "some" progress rating were: developing or modifying agricultural education curricula to address identified manpower requirements; shifting from an emphasis on dispensing facts to passive students to an emphasis on problem-solving and development of learning, research, and management competencies; developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation; developing strategic planning (envisaging and programming for the needs of the future) as a management tool; getting teaching staff involved in carrying out research on problems facing the agricultural sector; collaborating with agricultural extension organizations; and analyzing how the educational system, from primary and secondary levels through graduate/post-graduate education, is responding to the country's agricultural manpower requirements.

One item received a "no" progress rating—developing the flexibility for university staff to allocate and share time according to problems faced by the agricultural sector rather than the disciplines in which staff members were trained, while the Mission indicated that the host country had not sought to make progress in developing training programs in agricultural research management and organization.

Progress of TG&T Via Private Organizations

The Mission reported "much" progress in 6 (33) of the 18 categories—obtaining technology (e.g., germplasm) from appropriate regional or international sources; participating in national and regional research networks; mobilizing research support from the public sector (i.e., government funding); mobilizing research support from the private sector (i.e., private funding); improving the internal organization and management of private sector research organizations; and developing a program of on-farm trials as an integral part of an adaptive research program. Further, a rating of "some" progress was made for the remaining 12 (67%) of the categories.

Adequacy of Public Agricultural Research Organization

While the Mission rated the adequacy of the budget as "average," lower ratings ("poor" or "very poor") were assigned to specific budget items. The adequacy of the budget for per diem and equipment/supplies was rated as "very poor," while adequacy of the budget for salaries (urban- and field-based technical personnel and administrators) was rated as "poor." Adequacy in terms of the budget being available on a timely basis also was rated as "poor."

The Mission indicated that the adequacy of the numbers of trained personnel was inversely related with the level of training; in order words, the adequacy of the number of trained technical personnel at the Ingeniero Agrónomo and Perito Agrónomo levels was rated as "average," while those at the M.Sc.p and Ph.D-levels were rated as "poor" and "very poor," respectively. Adequacy with respect to the number of trained administrative personnel was rated as "poor."

Generally, The adequacy of administration and management systems was rated as "very poor," with only personnel development ("poor"), program planning ("average"), and program budgeting ("poor") receiving slightly higher ratings.

Adequacy of Public Agricultural Extension Organization

While the Mission rated the adequacy of the budget as "average," lower ratings ("poor" or "very poor") were assigned to specific budget items. The adequacy of the budget for per diem and equipment/supplies was rated as "very poor," while adequacy of the budget for salaries (urban- and field-based technical personnel and administrators) was rated as "poor." Adequacy in terms of the budget being available on a timely basis also was rated as "poor." (Note that this is the same pattern as was reported for public agricultural research organizations.)

Generally, with respect to the adequacy of the numbers of trained personnel, the same pattern as reported for public agricultural research organizations was reported for public agricultural extension organizations, However, the Mission indicated that the numbers of trained personnel at the M.Sc.- and Ingeniero Agrónomo levels was "very poor" (whereas these two items were only rated as "poor" in the case of public agricultural research organizations.

All areas of adequacy of administration and management systems were rated as "very poor," except that program planning and budgeting were rated slightly higher ("poor").

Generally, the quality of extension advice was rated as "average," while the percentage of farmers reached by extension and how farmers rated extension were rated as "poor."

Mission Funding for Agricultural TG&T Organizations

Mission funding for agricultural REE organizations during the 1980s increased in two areas—public extension and agricultural TG&T through private organizations. In the area of public agricultural extension, the Mission sought to expand the number of rural extension agencies located throughout the country, in order to improve communication methodologies to facilitate technology transfer, and provide greater access to information for small farmers. This support was provided through several projects, including Land Use Productivity Enhancement and several projects which are no longer operational.

In the area of technology generation and transfer through private organizations, Mission projects such as Export Development and Services and Honduran Agricultural Research Foundation provide support for establishing private, non-profit organizations to expand and improve marketing and research capabilities for non-traditional agricultural export crops, and enabling organizations such as FPX and FHIA to be more responsive to the marketing and technological needs of farmers, especially those producing for export.

During the 1980s, some Mission funding was allocated to support technology generation in public agricultural research organizations under the Honduran Agricultural Research (522-0139) project which has since been terminated. The project sought to alleviate the technological constraints affecting traditional and agrarian reform farmers, by expanding and strengthening ongoing multidisciplinary research in more regions of the country, and disseminating the results of research to small-scale farmers. Also, during the mid 1980s, the Mission funded activities to assist public sector higher agricultural educatior However, the Mission no longer funds activities in this area "nor would consider [funding such activities] under present conditions."

Progress of Current Mission Projects

In the area of technology transfer via public agricultural extension organizations, the Mission rated Land Use Productivity Enhancement as having achieved "some" progress, while Irrigation Development and Small Farmer Coffee Improvement were rated as having achieved "much" progress. In agricultural education, Zamorano Scholarships was rated as achieving "much" progress. In technology generation and transfer through private organizations, Honduran Agricultural Research Foundation was rated as having achieved "much" progress, while "some" progress was noted in the cases of Small Farmer Livestock Export Development and Services, and Small Farmer Organization Strengthening.

Constraints Internal to Public Sector Organizations

Two (or 33%) of the six factors were rated as a "major constraint": public agricultural organizations are weak and the problems of reforming them are too difficult to solve; and the country lacks qualified human resources to carry out a sustained program to develop public sector agricultural REE organizations. A "somewhat a constraint" rating was assigned to three factors—host country is too small to support a public sector agricultural REE effort; the country's government is unwilling to provide the funding required to cover the recurrent costs of field-level programs; and the country's government fails to see any benefit in investing more heavily in agricultural research, extension, or education.

Constraints Internal to USAID/Country Mission

Five factors were rated as being "somewhat a constraint" to improving agricultural research, extension, and education when these functions are the responsibility of public sector organizations: (1) there is an operational push toward short-term projects having highly visible, relatively immediate impact (in spite of a general commitment to long-term institution-building); (2) AID now emphasizes the private sector, rather than the public sector, as the principal means of development; (3) Mission strategy sees research, extension, and education separately rather than collectively; (4) Mission does not ave a strategy to get the research, extension, and education functions working in a coordinated manner; and (5) Mission does not have adequate staffing to deal effectively with agricultural research, extension, and/or education projects.

Mission Strategy for Improving Agricultural REE

The Mission identified the following as the priority issues relative to improving agricultural research, extension, and education in Honduras: (1) elimination of barriers which inhibit access to production inputs, production information, and adequate technology; and (2) establishing endowments and/or other means for sustained funding for responsive research, outreach, and higher agricultural education.

The Mission's strategy or plan to deal with these issues includes:

- Create local currency endowments to provide a stable and secure source of funding for (1) agricultural education scholarships, and (2) adaptive research and outreach activities within the private sector.

- Improve upon and extend the country's unified extension methodology to additional rural extension agency offices.

- Continue pressure for adequate public funding of CRSP activities and other priority research programs.

- Pursue policy changes by the GOH that will stimulate production, domestic consumption, and export.

The Mission plans to identify, develop, and implement projects involving all three REE functions. The rational underlying the Mission's strategy is that

> sustainable agricultural sector growth will require adequate numbers of trained agriculturalists, as well as responsive research and outreach programs that stimulate technology adoption by individual farmers. All these needs must be addressed.

Management Questions Facing the Mission

Two questions were identified:

1. How can the Mission maintain a well-rounded agricultural portfolio which addresses these and *other* sector issues in the face of dwindling DA and ESF funding?

2. Should the Mission continue to support projects carried out by poorly organized and administratively weak public sector entities or should the Mission place its resources in a program to assist in reforming and restructuring Ministry organization and service delivery mechanisms?

The Mission identified two areas in which assistance is needed:

- Assistance in examining the second of the above two questions, that is, continuing to fund public sector programs through weak and ineffective public entities, or

diverting resources to institution-building and strengthening public sector entities, thus improving the GOH structure and services in the agricultural sector.

- Assistance in developing the PID and PP for the upcoming agricultural sector adjustment program.

Opportunities to be Pursued

The Mission noted the following as areas to be pursued by AID: policy dialogue and use of non-project assistance mechanisms; and promotion and enhancement of private sector research and outreach capacity. Opportunities identified for other donors were: support and enhancement of the GOH's research and extension structure; and public sector agricultural education, especially at the secondary school level.

Program-level Performance Monitoring System

The goals of th ·sion's ARD portfolio are to:

1. Contribute to national economic development; and

2. Raise income and nutrition levels through—

   - Higher volumes of production and better prices for agricultural products;

   - Creating more employment; and

   - Increasing exports of agricultural products and the production of domestic foodstuffs.

The Mission indicated that it does not have an ARD program-level M&E plan.

USAID/ROCAP

Current & Planned Projects

Several current projects have components aimed at improving agricultural research, extension, or education. Two projects, Regional Coffee Pest Control (PROMECAFE) (596-0090) and Regional Agricultural Technology Networks (PROCACAO) (596-0127), have included components aimed at improving agricultural technology generation and transfer (TG&T) in public research and extension organizations. Further, the latter project includes components aimed at improving agricultural education and agricultural TG&T through private organizations.

The Tree Crop Production (596-0117), now known as Integrated Pest Management, has focused both on improving agricultural TG&T in public agricultural research and extension organizations as well as through private organizations. The Regional Environment and Natural Resources Management (RENARM) (596-0150) project includes components to improve technology generation by public agricultural research organizations, technology transfer by public agricultural extension organizations, agricultural education, and agricultural TG&T through private organizations.

Regional Agricultural Higher Education (596-0129) is aimed at improving agricultural education at the Tropical Agricultural Research and Training Center (CATIE) in Costa Rica. The majority of ROCAP's agricultural projects provide support to and are being implemented by CATIE, although in some cases (e.g., RENARM) there are other participating implementing agencies.

Non-Project Assistance

With regard to using non-project assistance to stimulate change in public sector resources allocated to agricultural REE institutions, the ROCAP Mission does not have ESF or PL-480 local currency; however, the Mission encourages and supports bilateral Missions in promotion of policy dialogue that furthers regional objectives. With regard to using non-project assistance to stimulate change in governmental policies and programs relating to agricultural REE institutions, the Mission is currently in the process of defining its position.

Progress of Public Agricultural Research Organizations

The Mission provided two sets of ratings. The ratings in Set 1 refer to the Mission's assessment of progress made through the Regional Coffee Pest Control (PROMECAFE) (596-0090) and Regional Agricultural Technology Networks (PROCACAO) (596-0127) projects. Set 2 specifically refers to progress made by CATIE, which organization is involved in PROMECAFE and PROCACAO but also in other projects such as Regional Agricultural Higher Education.

Set 1: The Mission noted "much" progress in three (16.7%) of 18 categories and "some" progress in nine (50%) categories. Areas in which "much" progress have been made

are: obtaining technology (e.g., germplasm) from regional and international agricultural research organizations, participating in national and regional research networks, and developing on-farm trials as an integral part of adaptive research. The balance of the areas received a "some" progress rating, except that the Mission indicated that five categories were not applicable, these being the adaptation of technology for the following commodity groups: staple food crops, livestock, import substitution crops, trees, non-traditional export crops, and fisheries/aquaculture. A rating of "some" progress was assigned to traditional export crops.

Set 2: The Mission indicated that "much" progress had been made in four (22%) of the 18 categories—adapting technology for the production of traditional export crops, import substitution crops, and trees; and collaborating with agricultural education organizations. All other categories (13 or 72%) were rated as having achieved "some" progress except that CATIE did not seek to make progress in improving technology generation for fisheries and aquaculture.

Progress of Public Agricultural Extension Organizations

Set 1: Six (37.5%) of 16 categories were identified as having made "much" progress—establishing a clear purpose statement; providing agricultural research system with information on existing farming systems, farmer problems, and performance of present and new technology under farm-level conditions; drawing upon research-based technologies (varieties, practices) to extend technology tested as appropriate for specific site and farmer circumstances; working with and through groups and community leaders to achieve efficiency and to accelerate spread of recommended technology; using a variety of methods for communication and instruction, selected on the basis of audience, objectives, and circumstances; and being responsive to new problems arising from use of new technology, such as storage, utilization, and marketing. The balance (10 or 62.7%) of the categories received a rating of "some" progress.

Set 2: Nine (56%) of the 16 categories were rated as having achieved "much" progress, as follows:

- Establishing a clear purpose statement—what organization does, who it serves, how it operates, how financed, and how evaluated.

- Providing agricultural research system with information on existing farming systems, farmer problems, and performance of present and new technology under farm-level conditions.

- Drawing upon research-based technologies (varieties, practices) to extend technology tested as appropriate for specific site and farmer circumstances.

- Locating offices and providing staff transportation to facilitate ready two-way access between farmers and extension workers.

- Working with and through groups and community leaders to achieve efficiency and to accelerate spread of recommended technology.

- Employing extension workers close in social distance to clients, and increasing their communication and organizational skills.

- Making extension workers competent in technical subjects and diagnostic skills under farm and field conditions.

- Improving extension workers' skills to conduct on-farm trials.

- Using a variety of methods for communication and instruction, selected on the basis of audience, objectives, and circumstances.

The remaining seven (44%) areas were rated as having made "some" progress.

Progress of Agricultural Education Organizations

Set 1: The Mission reported "much" progress in five (31.5%) of the 16 categories—shifting from an emphasis on dispensing facts to passive students to an emphasis on problem-solving and development of learning, research, and management competencies; developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation; developing training programs in agricultural research management and organization; collaborating with agricultural research organizations; and collaborating with agricultural extension organizations.

Further, the Mission indicated that "some" progress was noted for six (37.5%) categories—identifying the project manpower requirements in the agricultural sector; developing or modifying agricultural education curricula to address identified manpower requirements; developing experiential ("learning by doing") approaches and incorporating these into the educational curricula; developing strategic planning (envisaging and programming for the needs of the future) as a management tool; developing non-degree short courses to meet identified training needs of various audiences in the agricultural sector; and providing up-to-date text books and learning materials in the country's principal language of instruction. A "no" progress rating was given to the area of developing a diversified mix of funding by private, public, and international sources.

Four items (25%) were rated not applicable—developing the flexibility for university staff to allocate and share time according to agricultural sector problems rather than the disciplines in which staff members were trained; getting teaching staff involved in carrying out research on agricultural sector problems; analyzing how the educational system, from primary to secondary levels through graduate/post-graduate education, is responding to the country's agricultural manpower requirements; and developing the university's links with worldwide sources of agricultural knowledge.

Set 2: Eight (50%) of the categories received a "some" progress rating, the balance "much" progress, as follows:

- Identifying projected agricultural sector manpower requirements.
- Analyzing how the educational system (primary and secondary levels through graduate/post-graduate education), is meeting the country's agricultural manpower requirements.
- Developing agricultural education curricula to address identified manpower requirements.
- Developing a "systems" orientation to agricultural problems as compared with a strictly "production" orientation.
- Getting teaching staff involved in carrying out research on problems facing the agricultural sector.
- Collaborating with agricultural research organizations.
- Developing the university's links with worldwide sources of agricultural knowledge.
- Providing up-to-date text books and learning materials in the country's principal language of instruction.

Progress of TG&T Via Private Organizations[1]

The Mission reported "much" progress in 2 (11%) of the 18 categories—participating in national and regional research networks and adapting technology for the production of traditional export crops. Six (37.5%) areas received a "some" progress rating—getting the private sector involved in identifying research problems and setting research priorities; mobilizing research support from the public sector; mobilizing research support from the private sector; developing on-farm trials as an integral part of adaptive research; adapting technology for the production of trees; strengthening collaboration with agricultural extension organizations; and strengthening collaboration with agricultural education organizations. However, the Mission indicated that five categories were not applicable, these being the adaptation of technology for the following commodity groups: staple food crops, livestock, import substitution crops, non-traditional export crops, and fisheries/aquaculture. A rating of "some" progress was assigned to traditional export crops.

[1]This area was not applicable in the case of CATIE, hence the set of ratings in this section applies only to set 1.

Adequacy of Public Agricultural Research Organization

Set 1: Two aspects of the adequacy of the research budget—adequacy for per diem and equipment/supplies—were rated as very poor. On the other hand, a rating of "average" was given to salaries being available on a timely basis for urban-based technical personnel and administrators. However, the adequacy of the budget, availability of the budget on a timely basis, and adequacy of salaries for field-based technical personnel were rated as "poor." The adequacy of the numbers of research staff trained to the Ph.D. and M.Sc. levels was rated as poor, while the numbers of trained technical Ingeniero Agrónomo and Perito Agrónomo staff was rated slightly higher as "average." All aspects of personnel and program management systems were rated as "poor," except that program monitoring receiving a slightly higher "average" rating. (Note: the category of adequacy of the number of trained administrative personnel was not rated.)

Set 2: All aspects of the adequacy of CATIE's budget and the adequacy of the numbers of trained staff were rated "poor," except that two areas were rated as not applicable (Ingeniero Agrónomo and Perito Agrónomo). Similarly, three of the four aspects of the adequacy of personnel management systems were rated as "poor" (except personnel recruitment which was rated as "average"). All four aspects of program management systems were rated as "average."

Adequacy of Public Agricultural Extension Organization[2]

With one exception, all aspects of public sector agricultural extension were rated as "poor," including the performance criteria (% of farmers reached by extension, quality of extension advise, and farmer rating of extension). The one exception was the adequacy of the number of technical personnel trained to the Ph.D.-level, which received a "very poor" rating.

Mission Funding for Agricultural TG&T Organizations

Mission funding for agricultural REE organizations during the 1980s increased in three of the four categories—public research, public extension, and agricultural TG&T through private organizations. Funding for improvement of technology generation in public research organizations and technology transfer via public extension organizations increased as a result of new projects in agricultural technology transfer and coffee and cacao research on a regional basis, as well as projects in tree crop production, watershed management, integrated pest management, and environmental and natural resources management.

Increased funding to improve agricultural TG&T through private organizations was reflected in the Mission's efforts to encourage organization of private sector coffee and cacao producer associations. The Regional Agricultural Technology Networks (PROCACAO) (596-0127) project provided funding to assist the Pan American Development Foundation and

[2]This area was not applicable in the case of CATIE, hence the set of ratings in this section applies only to set 1.

Hershey Hummingbird to work with cacao producer associations. Increased funding also was provided to improve agricultural education through Regional Agricultural Higher Education. Also, the Regional Coffee Pest Control and Regional Agricultural Technology Networks projects cooperated with technical departments in existing universities.

Progress of Current Mission Projects

Regional Coffee Pest Control (596-0090) and Regional Agricultural Technology Networks (596-0127) were given a "some" progress rating vis-a-vis improving agricultural TG&T in public research and extension, while the latter project also was rated as having made "some" progress in improving agricultural education and TG&T through private organizations. The Integrated Pest Management (596-0117) received a "much" progress rating in technology generation in public research organizations and technology transfer in public extension organizations, while it made "some" progress in TG&T through private organizations. Regional Agricultural Higher Education (596-0129) was rated as having made "much" progress in improving agricultural education at CATIE.

Constraints Internal to Public Sector Organizations[3]

Set 1: Four factors were rated as "somewhat a constraint"—host country being too small to support a public sector agricultural REE effort; weakness of public agricultural organizations and the difficulty of reforming them; government unwillingness to provide the funding required to cover the recurrent costs of field-level programs; and lack of qualified human resources to carry out a sustained program to develop public sector agricultural REE organizations.

Set 2: The same four factors were also rated as constraints but as being "major constraints."

Constraints Internal to USAID/Country Mission

Set 1: Six factors were rated as "somewhat a constraint"—an operational push toward short-term projects having highly visible, relatively immediate impact (in spite of a general commitment to long-term institution-building); current AID emphasis on the private sector, rather than the public sector, as the principal means of development; AID's current emphasis on encouraging an export-led agricultural development strategy, rather than a food security strategy; an operational push toward conservation-oriented natural resource management projects (in spite of a recognized need for production-oriented sustainable agriculture); Mission strategy seeing research, extension, and education separately rather than collectively (i.e., as being interrelated); and Mission not having adequate staffing to deal effectively with agricultural REE projects.

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[3]This area was not applicable in the case of CATIE, hence the set of ratings in this section applies only to set 1.

The Mission indicated as "not a constraint" the following: "Mission does not have a strategy to get the research, extension, and education functions working in a coordinated manner."

Set 2: Basically the same ratings were given for this set as for set 1, except that one factor (Mission strategy seeing research, extension, and education separately rather than collectively) was rated as "not a constraint," while another factor (Mission not having adequate staffing to deal effectively with agricultural REE projects) was rated as a "major constraint" rather than as only "somewhat a constraint."

Mission Strategy for Improving Agricultural REE

The Mission identified the following as the priority issues relative to improving agricultural research, extension, and education in the Central American region:

> (1) Willingness on the part of C.A. Governments to be responsible for their own growth and cooperate with other countries in the region. (2) Failure to maintain technological advantage to upgrade productivity. (3) Lack of persistent financial commitments. (4) Lack of problem solving oriented agriculture research. (5) Maintenance and improvement of undergraduate educational facilities.

The Mission's strategy or plan to deal with these issues is in the process of being defined. "However, weak professional resources, which limit the capacity to develop and extend technology and manage sectorial performance will undoubtedly become a major focus of the Regional Strategy." The Mission indicated that although the Regional Strategy has yet to be determined, "it is very likely that future AID support will concentrate on a few of the Centers of Academic excellence with selective training abroad. This is based on the C.A. Presidents' Commitment to stimulating policies, programs, and projects in education, scientific research, and technology dissemination."

The Mission indicated, with specific reference to CATIE, that the "fundamental issue underlying CATIE's problems with its budget, personnel, program direction, technology generation and transfer, etc. is related to differences in values and priorities regarding financial discipline, program direction and stewardship of resources between management and the Board and the donors upon which it depends." ROCAP's strategy to deal with this problem has two dimensions:

> **In the region**: Strengthen networks between ARE&E entities for: a) information exchange; b) technology generation and transfer; c) apportionment and coordination of research and educational priorities along established lines of comparative advantages; d) allocation of scarce resources; [and] e) harmonization of curriculum and instruction, entrance requirements, [and] degree programs with national systems.
>
> **At CATIE**: The focus of the activities under RENARM and the Tree Cropping project is on problem solving research, outreach and training. ARE&E is improved at CATIE in the degree to which objectives in these three areas are mutually

supportive and reinforcing in addressing problems of increasing agricultural productivity and improved natural resource management.

ROCAP plans projects involving all three REE functions.

The rationale underlying the Mission's strategy was summarized by the Mission from the RENARM Project Paper, as follows:

> The rationale underlying ROCAP's strategy is that there is a constant requirement for research, development, and modification of technologies to solve problems unique to the region. The network of public institutions that exists in the region is inadequate to the task, has insufficient financial resources, and for the most part, diffuse research and training objectives. Strengthening the scientific and technological capability of the region is a necessary first step to designing and executing the interventions required for a rational, profitable and sustainable exploitation of natural resources.

Management Questions Facing the Mission

The Mission indicated that AID's development assistance "will hinge on the willingness of the regional governments to reform their macroeconomic and sectorial policies." The Mission identified the following as meriting attention:

> (1) Study and analysis of regional progress being made to correct discriminatory macroeconomic policies and irrational sectorial policies. (2) Need to establish a directory of agriculture research and education. (3) Analyze the factors and/or requirements for building a coherent C.A. agricultural science, technology and higher education system.

With respect to CATIE, the Mission indicated that, in about a year's time (September 1991), the Inter-American Board of Agriculture (JIA, as its known in Spanish) will meet to consider whether the Inter-American Institute for Cooperation on Agriculture (IICA) should re-absorb CATIE or complete its independence and require that the member countries support it more fully.

Opportunities to be Pursued

The Mission noted that "ROCAP could provide strong support to C.A. Governments in their efforts to develop a C.A. network to generate and [adapt] technology to the region's ecological conditions." Other donors could play a role by providing financial and technical support to IICA and CATIE. Further, the Mission suggested that AID consider developing "a strategy for guiding the involvement of USLG colleges and universities in REDCA in furtherance of the [Agency's] objectives for the region." Also, the Mission suggested that donors such as IDB and the World Bank should "more fully consider indigenous sources of technical assistance such as CATIE in carrying out their projects in watershed management and other areas."

Program-Level Performance Monitoring System

The Mission indicated that the Regional Coffee Pest Control and Regional Agricultural Technology Networks projects will be terminating in December 1990; and that additional ARD goals will need to be defined when the "new ROCAP Strategy is in place." The ROCAP ARD strategy was to be defined during the ARDO meetings in Guatemala, September 10-13, 1990.

The Mission indicated that it does not have an ARD program-level M&E plan; however, the implementing agency (IICA) for the coffee and cacao projects uses its own M&E systems to track the performance of those projects. Further, with respect to the RENARM project, a proposal for the RENARM M&E plan has been received and is being evaluated, with a contract for the project expected to be signed before September 30, 1990.

ANNEX E
SURVEY QUESTIONNAIRE SUMMARY TABLES OF USAID MISSION ASSESSMENTSOF STATUS OF AGRICULTURAL REE IN AID-ASSISTED LAC COUNTRIES

Table No.

ANDEAN REGION

E.1. Progress of Agricultural Technology Generation and Transfer Organizations in the Andean Region (Based on USAID Mission Ratings of N Attributes).

E.2. Adequacy of Public Sector Organization Primarily Responsible for Ag Research in the Andean Region (Based on USAID Mission Ratings of N Attributes).

E.3. Adequacy of Public Sector Organization Primarily Responsible for Ag Extension in the Andean Region (Based on USAID Mission Ratings of N Attributes).

E.4. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to Public Sector Organizations in the Andean Region.

E.5. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to USAID/Country Mission in the Andean Region.

CARIBBEAN REGION

E.6. Progress of Agricultural Technology Generation and Transfer Organizations in the Caribbean Region (Based on USAID Mission Ratings of N Attributes).

E.7. Adequacy of Public Sector Organization Primarily Responsible for Ag Research in the Caribbean Region (Based on USAID Mission Ratings of N Attributes).

E.8. Adequacy of Public Sector Organization Primarily Responsible for Ag Extension in the Caribbean Region (Based on USAID Mission Ratings of N Attributes).

E.9. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to Public Sector Organizations in the Caribbean Region.

E.10. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to USAID/Country Mission in the Caribbean Region.

CENTRAL AMERICAN REGION

E.11. Progress of Agricultural Technology Generation and Transfer Organizations in the Central American Region (Based on USAID Mission Ratings of N Attributes).

E.12. Adequacy of Public Sector Organization Primarily Responsible for Ag Research in the Central American Region (Based on USAID Mission Ratings of N Attributes).

E.13. Adequacy of Public Sector Organization Primarily Responsible for Ag Extension in the Central American Region (Based on USAID Mission Ratings of N Attributes).

E.14. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to Public Sector Organizations in the Central American Region.

E.15. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to USAID/Country Mission in the Central American Region.

Table E.1. **Progress of Agricultural Technology Generation and Transfer Organizations in the Andean Region (Based on USAID Mission Ratings of N Attributes).**

Progress: DS=Didn't Seek; NP=No Progress; SP=Some Progress; MP=Much Progress; R=Rank

1a. Public Agricultural Research (PR)

Country	DS	NP	SP	MP	SP+MP	%	R
Bolivia	0	2	15	1	16	89	1
Ecuador	2	11	5	0	5	28	3
Perú	1	3	14	0	14	78	2
Total	3	16	34	1			
%	5	30	63	2			
% Sum		35		65	(N = 18)		

1b. Public Agricultural Extension (PX)

Country	DS	NP	SP	MP	SP+MP	%	R
Bolivia	4	6	6	0	6	38	2
Ecuador	0	0	16	0	16	100	1
Perú	0	16	0	0	0	0	3
Total	4	22	22	0			
%	8	46	46	0			
% Sum		54		46	(N = 16)		

1c. Agricultural Education (AE)

Country	DS	NP	SP	MP	SP+MP	%	R
Bolivia	1	3	12	0	12	75	1
Ecuador	0	9	7	0	7	44	2
Perú	1	9	6	0	6	38	3
Total	2	21	25	0			
%	4	44	52	0			
% Sum		48		52	(N = 16)		

1d. Private TG&T (P&)

Country	DS	NP	SP	MP	SP+MP	%	R
Bolivia	0	1	17	0	17	94	1
Ecuador	1	5	10	2	12	67	2
Perú	0	7	8	3	11	61	3
Total	1	13	35	5			
%	2	24	65	9			
% Sum		26		74	(N = 18)		

1e. R1 = Average of % SP+MP

Country	PR	PX	AE	P&	Avg.	R1
Bolivia	89	38	75	94	74	1
Ecuador	28	100	44	67	60	2
Perú	78	0	38	61	44	3
Avg.	65	46	52	74	59	
Rank (R4)	2	4	3	1		

1f. R2 = Avg. Ranks (R)

Country	PR	PX	AE	P&	Avg.	R2
Bolivia	1	2	1	1	1.25	1
Ecuador	3	1	2	2	2.00	2
Perú	2	3	3	3	2.75	3

1g. R3=Avg.R1&R2

Country	R1	R2	Avg.	R3
Bolivia	1	1	1	1
Ecuador	2	2	2	2
Perú	3	3	3	3

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.2. Adequacy of Public Sector Organization Primarily Responsible for Ag Research in the Andean Region (Based on USAID Mission Ratings of N Attributes).

Adequacy: VG=Very Good; GD=Good; AV=Avg.; PR=Poor; VP=Very Poor
R=Rank

2a. Adequacy-BU (Budget)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Bolivia	0	0	0	0	7	7	100	1
Ecuador	0	0	0	6	1	7	100	1
Perú	0	0	0	0	7	7	100	1
Total	0	0	0	6	15			
%				29	71			
% Sum					100	(N = 7)		

2b. Adequacy-NT (Numbers Trained)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Bolivia	0	0	1	2	2	4	80	1
Ecuador	0	0	2	3	0	3	60	2
Perú	0	4	1	0	0	0	0	3
Total	0	4	4	5	2			
%				33	13			
% Sum					46	(N = 5)		

2c. Adequacy-PM (Personnel Mgmt. Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Bolivia	0	0	0	4	0	4	100	1
Ecuador	0	0	0	3	1	4	100	1
Perú	0	0	0	0	4	4	100	1
Total	0	0	0	7	5			
%				58	42			
% Sum					100	(N = 4)		

2d. Adequacy-PP (Program Planning Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Bolivia	0	0	0	0	4	4	100	1
Ecuador	0	0	0	4	0	4	100	1
Perú	0	0	0	0	4	4	100	1
Total	0	0	0	4	8			
%				33	67			
% Sum					100	(N = 4)		

(Table 2 continued on following page)

Table E.2. (continued)

2e. R1 = Average of % PR+VP

Country	BU	NT	PM	PP	Avg.	R1
Bolivia	100	80	100	100	95	1
Ecuador	100	60	100	100	90	2
Perú	100	0	100	100	75	3
Avg.	100	47	100	100	87	
Rank (R4)	1	2	1	1		

2f. R2 = Avg. Ranks (R)

Country	BU	NT	PM	PP	Avg.	R2
Bolivia	1	1	1	1	1.00	1
Ecuador	1	2	1	1	1.25	2
Perú	1	3	1	1	1.50	3

2g. R3=Avg.R1&R2

Country	R1	R2	Avg.	R3
Bolivia	1	1	1	1
Ecuador	2	2	2	2
Perú	3	3	3	3

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.3. Adequacy of Public Sector Organization Primarily Responsible for Ag Extension in the Andean Region (Based on USAID Mission Ratings of N Attributes).

Adequacy: VG=Very Good; GD=Good; AV=Avg.; PR=Poor; VP=Very Poor
R=Rank

3a. Adequacy-BU (Budget)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Bolivia	0	0	0	0	7	7	100	1
Ecuador	0	0	0	6	1	7	100	1
Perú	0	0	0	0	7	7	100	1
Total	0	0	0	6	15			
%				29	51			
% Sum					100	(N = 7)		

3b. Adequacy-NT (Numbers Trained)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Bolivia	0	0	0	1	3	4	100	1
Ecuador	0	0	0	3	2	5	100	1
Perú	0	4	1	0	0	0	0	3
Total	0	4	1	4	5			
%				27	33			
% Sum					60	(N = 5)		

3c. Adequacy-PM (Personnel Mgmt. Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Bolivia	0	0	0	0	4	4	100	1
Ecuador	0	0	0	3	1	4	100	1
Perú	0	0	0	0	4	4	100	1
Total	0	0	0	3	9			
%				25	75			
% Sum					100	(N = 4)		

3d. Adequacy-PP (Program Planning Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Bolivia	0	0	0	0	4	4	100	1
Ecuador	0	0	0	4	0	4	100	1
Perú	0	0	0	0	4	4	100	1
Total	0	0	0	4	8			
%				33	67			
% Sum					100	(N = 4)		

(Table 3 continued on following page)

Table E.3. (continued)

3e. R1 = Average of % PR+VP

Country	BU	NT	PM	PP	Avg.	R1
Bolivia	100	100	100	100	100	1
Ecuador	100	100	100	100	100	1
Perú	100	0	100	100	75	2
Avg.	100	67	100	100	92	
Rank (R4)	1	2	1	1		

3f. R2 = Avg. Ranks (R)

Country	BU	NT	PM	PP	Avg.	R2
Bolivia	1	1	1	1	1	1
Ecuador	1	1	1	1	1	1
Perú	1	3	1	1	1.5	2

3g. R3=Avg.R1&R2

Country	R1	R2	Avg.	R3
Bolivia	1	1	1	1
Ecuador	1	1	1	1
Perú	2	2	2	2

3h. Adequacy of Performance

Country	VG	GD	AV	PR	VP	PR+VP	%	R5
Bolivia	0	0	1	1	1	2	67	2
Ecuador	0	0	1	2	0	2	67	2
Perú	0	0	0	0	3	3	100	1
Total	0	0	2	3	4			
%				33	44			
% Sum					77	(N = 3)		

3i. Comparison of System Adequacy and Performance

Country	R3	R5
Bolivia	1	2
Ecuador	1	2
Perú	2	1

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.4. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to Public Sector Organizations in the Andean Region.

Key 3 = Major Constraint; 2 = Somewhat a Constraint

Constraint[1]	Bolivia	Ecuador	Perú	Avg.	Rank
a. Small Country Size	2	-	-	2.0	3
b. Weak Public Sector	2	3	3	2.67	1
c. Govt. Not Willing Fund REE	3	2	3	2.67	1
d. Lack Human Resources	3	2	-	2.5	2
e. Govt. Not See Benefit of Investing in REE	2	3	-	2.5	2
f. Lack of Technology Demand	2	2	-	2.0	3
Average	2.3	2.4	3.0	2.39	
Rank	3	2	1		

[1]Averages based on sum of item ratings in a row or column, divided by total number of items in row or column rated by Mission as "major constraint" (3) or "somewhat a constraint" (2).

Table E.5. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to USAID/Country Mission in the Andean Region.

Key 3 = Major Constraint; 2 = Somewhat a Constraint

Constraint[2]	Bolivia	Ecuador	Perú	Avg.	Rank
a. Push toward Short-Term Projects	2	-	-	2	2
b. Private Sector Emphasis	2	2	-	2	2
c. Export-Led Development Strategy	2	-	-	2	2
d. Push toward Natural Resources	-	-	-	-	-
e. Mission Sees REE Separately	2	-	-	2	2
f. Mission Lacks REE Coordination Strategy	-	-	-	-	-
g. Mission Lacks Adequate Staff to Deal w/ REE	3	-	3	3	1
Average	2.2	2	3	2.2	
Rank	2	3	1		

[2]Averages based on sum of item ratings in a row or column, divided by total number of items in row or column rated by Mission as "major constraint" (3) or "somewhat a constraint" (2).

Table E.6. Progress of Agricultural Technology Generation and Transfer Organizations in the Caribbean Region (Based on USAID Mission Ratings of N Attributes).

Progress: DS=Didn't Seek; NP=No Progress; SP=Some Progress; MP=Much Progress; R=Rank

	1a. Public Agricultural Research (PR)							1b. Public Agricultural Extension (PX)						
Country	DS	NP	SP	MP	SP+MP	%	R	DS	NP	SP	MP	SP+MP	%	R
Dom. Rep.	3	13	2	0	2	11	4	7	9	0	0	0	0	4
Haiti	4	5	9	0	9	50	2	3	11	2	0	2	12	3
Jamaica	2	10	5	1	6	33	3	0	0	15	1	16	100	1
RDO/C	0	4	11	3	14	78	1	0	0	9	7	16	100	1
Total	9	32	27	4				10	20	26	8			
%	13	44	38	5				16	31	41	12			
% Sum		57		43	(N = 18)				47		53	(N = 16)		

	1c. Agricultural Education (AE)							1d. Private TG&T (P&)						
Country	DS	NP	SP	MP	SP+MP	%	R	DS	NP	SP	MP	SP+MP	%	R
Dom. Rep.	1	5	3	7	10	63	3	0	1	7	10	17	95	1
Haiti	8	7	1	0	1	6	4	10	2	6	0	6	33	3
Jamaica	0	4	12	0	12	75	2	0	2	14	2	16	89	2
RDO/C	2	1	9	4	13	81	1	6	7	5	0	5	28	4
Total	11	17	25	11				16	12	32	12			
%	17	27	39	17				22	17	44	17			
% Sum		44		56	(N = 16)				39		61	(N = 18)		

	1e. R1 = Average of % SP+MP						1f. R2 = Avg. Ranks (R)						1g. R3=Avg.R1&R2			
Country	PR	PX	AE	P&	Avg.	R1	PR	PX	AE	P&	Avg.	R2	R1	R2	Avg.	R3
Dom. Rep.	11	0	63	95	42	3	4	4	3	1	3	4	3	4	3.5	3
Haiti	50	12	6	33	26	4	2	3	4	3	3	4	4	4	4.0	4
Jamaica	33	100	75	89	74	1	3	1	2	2	2	2	1	2	1.5	1
RDO/C	78	100	81	28	72	2	1	1	1	4	1.75	1	2	1	1.5	1
Avg.	43	53	56	61	53											
Rank (R4)	4	3	2	1												

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.7. **Adequacy of Public Sector Organization Primarily Responsible for Ag Research in the Caribbean Region (Based on USAID Mission Ratings of N Attributes).**

Adequacy: VG=Very Good; GD=Good; AV=Avg.; PR=Poor; VP=Very Poor
R=Rank

2a. Adequacy-BU (Budget)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Dom. Rep.	0	0	0	3	4	7	100	4
Haiti	0	0	4	0	3	3	43	2
Jamaica	0	0	0	5	2	7	100	4
RDO/C	5	1	1	0	0	0	0	1
Total	5	1	5	8	9			
%	18	4	18	29	32			
% Sum					61	(N = 7)		

2b. Adequacy-NT (Numbers Trained)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Dom. Rep.	0	1	2	1	1	2	40	3
Haiti	0	0	4	1	0	1	20	2
Jamaica	0	0	2	2	1	3	60	4
RDO/C	0	2	3	0	0	0	0	1
Total	0	3	11	4	2			
%	0	15	55	20	10			
% Sum					30	(N = 5)		

2c. Adequacy-PM (Personnel Mgmt. Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Dom. Rep.	0	0	0	0	4	4	100	4
Haiti	0	0	0	4	0	4	100	4
Jamaica	0	0	0	1	3	4	100	4
RDO/C	0	3	1	0	0	0	0	1
Total	0	3	1	5	7			
%	0	19	6	31	44			
% Sum					75	(N = 4)		

2d. Adequacy-PP (Program Planning Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Dom. Rep.	0	0	0	0	4	4	100	4
Haiti	0	0	0	4	0	4	100	4
Jamaica	0	0	0	1	3	4	100	4
RDO/C	0	3	1	0	0	0	0	1
Total	0	3	1	5	7			
%	0	19	6	31	44			
% Sum					75	(N = 4)		

(Table E.7 continued on following page)

Table E.7. (continued)

2e. R1 = Average of % PR+VP

Country	BU	NT	PM	PP	Avg.	R1
Dom. Rep.	100	40	100	100	85	3
Haiti	43	20	100	100	66	2
Jamaica	100	60	100	100	90	4
RDO/C	0	0	0	0	0	1
Avg.	61	30	75	75	60	
Rank (R4)	2	1	4	4		

2f. R2 = Avg. Ranks (R)

Country	BU	NT	PM	PP	Avg.	R2
Dom. Rep.	4	3	4	4	3.75	3
Haiti	2	2	4	4	3.00	2
Jamaica	4	4	4	4	4.00	4
RDO/C	1	1	1	1	1.00	1

2g. R3=Avg.R1&R2

Country	R1	R2	Avg.	R3
Dom. Rep.	3	3	3	3
Haiti	2	2	2	2
Jamaica	4	4	4	4
RDO/C	1	1	1	1

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.3. Adequacy of Public Sector Organization Primarily Responsible for Ag Extension in the Caribbean Region (Based on USAID Mission Ratings of N Attributes).

Adequacy: VG=Very Good; GD=Good; AV=Avg.; PR=Poor; VP=Very Poor
R=Rank

3a. Adequacy-BU (Budget)

Country	VG	GD	AV	PR	VP	PR+VP	%	R	
Dom. Rep.	0	0	0	3	4	7	100	4	
Haiti	0	0	4	0	3	3	43	2	
Jamaica	0	0	2	3	1	4	67	3	(1 missing)
RDO/C	0	0	7	0	0	0	0	1	
Total	0	0	13	6	8				
%	0	0	46	21	29				
% Sum					50	(N = 7)			

3b. Adequacy-NT (Numbers Trained)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Dom. Rep.	0	1	2	1	1	2	40	4
Haiti	0	0	4	1	0	1	20	1
Jamaica	0	1	3	1	0	1	20	1
RDO/C	0	0	3	2	0	2	40	4
Total	0	2	12	5	1			
%	0	10	60	25	5			
% Sum					30	(N = 5)		

3c. Adequacy-PM (Personnel Mgmt. Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Dom. Rep.	0	0	0	0	4	4	100	4
Haiti	0	0	0	0	4	4	100	4
Jamaica	0	0	2	2	0	2	50	2
RDO/C	0	0	3	1	0	1	25	1
Total	0	0	5	3	8			
%	0	0	31	19	50			
% Sum					69	(N = 4)		

3d. Adequacy-PP (Program Planning Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Dom. Rep.	0	0	0	0	4	4	100	4
Haiti	0	0	0	0	4	4	100	4
Jamaica	0	0	1	3	0	3	75	2
RDO/C	0	0	4	0	0	0	0	1
Total	0	0	5	3	8			
%	0	0	31	19	50			
% Sum					69	(N = 4)		

(Table 3 continued on following page)

Table E.3. (continued)

3e. R1 = Average of % PR+VP

Country	BU	NT	PM	PP	Avg.	R1
Dom. Rep.	100	40	100	100	85	4
Haiti	43	20	100	100	66	3
Jamaica	67	20	50	75	40	2
RDO/C	0	40	25	0	16	1
Avg.	61	30	75	75	60	
Rank (R4)	2	1	4	4		

3f. R2 = Avg. Ranks (R)

Country	BU	NT	PM	PP	Avg.	R2
Dom. Rep.	4	4	4	4	4.00	4
Haiti	2	1	4	4	2.75	3
Jamaica	3	1	2	2	2.00	2
RDO/C	1	4	1	1	1.75	1

3g. R3=Avg.R1&R2

Country	R1	R2	Avg.	R3
Dom. Rep.	4	4	4	4
Haiti	3	3	3	3
Jamaica	2	2	2	2
RDO/C	1	1	1	1

3h. Adequacy of Performance

Country	VG	GD	AV	PR	VP	PR+VP	%	R5
Dom. Rep.	0	0	0	0	3	3	75	3
Haiti	0	0	1	0	2	2	100	4
Jamaica	0	0	0	2	1	3	75	3
RDO/C	0	1	2	0	0	0	0	1
Total	0	1	3	2	6			
%	0	8	25	17	50			
% Sum					67	(N = 3)		

3i. Comparison of System Adequacy and Performance

Country	R3	R5
Dom. Rep.	4	3
Haiti	3	4
Jamaica	2	3
RDO/C	1	1

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.9. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to Public Sector Organizations in the Caribbean Region.

Key 3 = Major Constraint; 2 = Somewhat a Constraint

Constraint[3]	Jamaica	Haiti	Dom.Rep.	RDO/C	Avg.	Rank
a. Small Country Size	2	3	-	3	2.67	2
b. Weak Public Sector	3	3	3	-	3.00	1
c. Govt. Not Willing Fund REE	3	3	3	-	3.00	1
d. Lack Human Resources	2	-	-	2	2.00	3
e. Govt. Not See Benefit of Investing in REE	2	2	3	2	2.25	4
f. Lack of Technology Demand	2	2	-	-	2.20	5
Average	2.33	2.60	3.00	2.33	2.52	
Rank	4	2	1	4		

[3]Averages based on sum of item ratings in a row or column, divided by total number of items in row or column rated by Mission as "major constraint" (3) or "somewhat a constraint" (2).

Table E.10. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to USAID/Country Mission in the Caribbean Region.

Key 3 = Major Constraint; 2 = Somewhat a Constraint

Constraint[4]	Haiti	Jamaica	Dom.Rep.	RDO/C	Avg.	Rank
a. Push toward Short-Term Projects	2	2	-	-	2.00	4
b. Private Sector Emphasis	2	3	2	2	2.25	3
c. Export-Led Development Strategy	2	2	2	2	2.00	4
d. Push toward Natural Resources	2	-	-	-	2.00	4
e. Mission Sees REE Separately	3	2	-	-	2.50	2
f. Mission Lacks REE Coordination Strategy	3	3	-	-	3.00	1
g. Mission Lacks Adequate Staff to Deal w/ REE	-	-	3	-	3.00	1
Average	2.33	2.4	2.33	2.0	2.39	
Rank	3	1	3	4		

[4]Averages based on sum of item ratings in a row or column, divided by total number of items in row or column rated by Mission as "major constraint" (3) or "somewhat a constraint" (2).

Table E.11. Progress of Agricultural Technology Generation and Transfer Organizations in the Central American Region (Based on USAID Mission Ratings of N Attributes).

Progress: DS=Didn't Seek; NP=No Progress; SP=Some Progress; MP=Much Progress; R=Rank

1a. Public Agricultural Research (PR)

Country	DS	NP	SP	MP	SP+MP	%	R
Belize	0	2	13	3	16	89	1
C.R.	0	12	6	0	6	33	4
E.S.	2	10	6	0	6	33	4
Guatemala	1	3	11	3	14	78	2
Honduras	0	8	9	1	10	56	3
Total	3	35	45	7			
%	3	39	50	8			
% Sum		42		58	(N = 18)		

1b. Public Agricultural Extension (PX)

Country	DS	NP	SP	MP	SP+MP	%	R
Belize	0	0	16	0	16	100	1
C.R.	0	16	0	0	0	0	5
E.S.	0	13	3	0	3	19	4
Guatemala	0	2	14	0	14	88	2
Honduras	2	5	9	0	9	56	3
Total	2	36	42	0			
%	3	45	53	0			
% Sum		47		53	(N = 16)		

1c. Agricultural Education (AE)

Country	DS	NP	SP	MP	SP+MP	%	R
Belize	0	4	12	0	12	75	1
C.R.	0	16	0	0	0	0	5
E.S.	0	15	1	0	1	6	4
Guatemala	5	6	5	0	5	31	2
Honduras	9	4	3	0	3	19	3
Total	14	45	21	0			
%	17	57	26	0			
% Sum		74		26	(N = 16)		

1d. Private TG&T (P&)

Country	DS	NP	SP	MP	SP+MP	%	R
Belize	0	4	11	3	14	78	2
C.R.	3	3	6	6	12	67	3
E.S.	5	2	7	4	11	61	4
Guatemala	6	2	10	0	10	56	5
Honduras	0	0	12	6	18	100	1
Total	14	11	46	19			
%	16	12	51	21			
% Sum		28		72	(N = 18)		

1e. R1 = Average of % SP+MP

Country	PR	PX	AE	P&	Avg.	R1
Belize	89	100	75	78	85	1
C.R.	33	0	0	67	50	4
E.S.	33	19	6	61	30	5
Guatemala	78	88	31	56	57	3
Honduras	56	56	19	100	58	2
Avg.	58	53	26	72	56	
Rank (R4)	2	3	4	1		

1f. R2 = Avg. Ranks (R) / 1g. R3=Avg.R1&R2

Country	PR	PX	AE	P&	Avg.	R2	R1	R2	Avg.	R3
Belize	1	1	1	2	1.25	1	1	1	1	1
C.R.	5	5	5	3	4.50	5	4	5	4.5	4
E.S.	5	4	4	4	4.25	4	5	4	4.5	4
Guatemala	2	2	2	5	2.75	3	3	3	3	3
Honduras	3	3	3	1	2.50	2	2	2	2	2

(Table 1 continued on following page)

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.11. (continued)

Progress: DS=Didn't Seek; NP=No Progress; SP=Some Progress; MP=Much Progress; R=Rank

	1h. Public Agricultural Research (PR)						1i. Public Agricultural Extension (PX)					
Country	DS	NP	SP	MP	SP+MP	%	DS	NP	SP	MP	SP+MP	%
C.A. Avg.	1	7	9	1	10	56	0	7	8	0	8	50
C.A. (RO)	0	0	9	3	12	67	0	0	10	6	16	100
CATIE(RO)	0	0	14	4	18	100	0	0	7	9	16	100
					(N = 18)						(N = 16)	

	1j. Agricultural Education (AE)						1k. Private TG&T (P&)					
Country	DS	NP	SP	MP	SP+MP	%	DS	NP	SP	MP	SP+MP	%
C.A. Avg.	3	9	4	0	4	25	3	2	9	4	13	72
C.A. (RO)	0	1	6	5	11	69	0	3	7	3	10	56
CATIE(RO)	0	0	8	8	16	100		n, a				
					(N = 16)						(N = 18)	

	1l. R1 = Average of % SP+MP				
Country	PR	PX	AE	P&	Avg.
C.A. Avg.	56	50	25	72	51
C.A. (RO)	67	100	69	56	73
CATIE(RO)	100	100	100	n/a	100
Rank (R4)					
C.A. Avg.	2	3	4	1	
CATIE (RO)	3	1	2	4	

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.12. Adequacy of Public Sector Organization Primarily Responsible for Ag Research in the Central American Region (Based on USAID Mission Ratings of N Attributes).

Adequacy: VG=Very Good; GD=Good; AV=Avg.; PR=Poor; VP=Very Poor
R=Rank

2a. Adequacy-BU (Budget)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Belize	0	0	0	6	1	7	100	1
C.R.	0	0	2	1	4	5	71	4
E.S.	0	0	0	3	4	7	100	1
Guatemala	0	0	3	3	1	4	57	5
Honduras	0	0	1	4	2	6	86	3
Total	0	0	6	17	12			
%				49	34			
% Sum					83	(N = 7)		

2b. Adequacy-NT (Numbers Trained)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Belize	0	0	4	1	0	1	20	5
C.R.	0	0	0	0	5	5	100	1
E.S.	0	0	3	0	2	2	40	3
Guatemala	0	0	3	1	1	2	40	3
Honduras	0	0	2	2	1	3	60	2
Total	0	0	12	4	9			
%				16	36			
% Sum					52	(N = 5)		

2c. Adequacy-PM (Personnel Mgmt. Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Belize	0	0	0	3	1	4	100	1
C.R.	0	0	0	0	4	4	100	1
E.S.	0	0	0	3	1	4	100	1
Guatemala	0	0	4	0	0	0	0	5
Honduras	0	0	0	1	3	4	100	1
Total	0	0	4	7	9			
%				35	45			
% Sum					80	(N = 4)		

2d. Adequacy-PP (Program Planning Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Belize	0	0	0	4	0	4	100	1
C.R.	0	0	0	0	4	4	100	1
E.S.	0	0	0	1	3	4	100	1
Guatemala	0	0	4	0	0	0	0	5
Honduras	0	0	1	1	2	3	75	4
Total	0	0	5	6	9			
%				30	45			
% Sum					75	(N = 4)		

(Table E.12 continued on following page)

Table E.12. (continued)

2e. R1 = Average of % PR+VP

Country	BU	NT	PM	PP	Avg.	R1
Belize	100	20	100	100	80	3
C.R.	71	100	100	100	93	1
E.S.	100	40	100	100	85	2
Guatemala	57	40	0	0	24	5
Honduras	86	60	100	75	80	3
Avg.	83	52	80	75	72	
Rank (R4)	1	4	2	3		
C.A. (*)	71	60	100	75	77	
CATIE (*)	100	100	75	0	69	

* = As rated by ROCAP

2f. R2 = Avg. Ranks (R)

Country	BU	NT	PM	PP	Avg.	R2
Belize	1	5	1	1	2	3
C.R.	4	1	1	1	1.75	2
E.S.	1	3	1	1	1.5	1
Guatemala	5	3	5	5	4.5	5
Honduras	3	2	1	4	2.5	4

2g. R3=Avg.R1&R2

Country	R1	R2	Avg.	R3
Belize	3	3	3.0	3
C.R.	1	2	1.5	1
E.S.	2	1	1.5	1
Guatemala	5	5	5.0	5
Honduras	3	4	3.5	4

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.13. Adequacy of Public Sector Organization Primarily Responsible for Ag Extension in the Central American Region (Based on USAID Mission Ratings of N Attributes).

Adequacy: VG=Very Good; GD=Good; AV=Avg.; PR=Poor; VP=Very Poor
R=Rank

3a. Adequacy-BU (Budget)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Belize	0	0	0	7	0	7	100	1
C.R.	0	0	2	1	4	5	71	4
E.S.	0	0	0	0	7	7	100	1
Guatemala	0	0	3	3	1	4	57	5
Honduras	0	0	1	4	2	6	86	3
Total	0	0	6	15	14			
%				43	40			
% Sum					83	(N = 7)		

3b. Adequacy-NT (Numbers Trained)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Belize	0	0	2	1	2	3	60	3
C.R.	0	0	0	0	5	5	100	1
E.S.	0	0	3	0	2	2	40	4
Guatemala	0	0	3	1	1	2	40	4
Honduras	0	0	1	1	3	4	80	2
Total	0	0	9	3	13			
%				12	52			
% Sum					64	(N = 5)		

3c. Adequacy-PM (Personnel Mgmt. Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Belize	0	0	0	4	0	4	100	1
C.R.	0	0	0	0	4	4	100	1
E.S.	0	0	0	4	0	4	100	1
Guatemala	0	0	4	0	0	0	0	5
Honduras	0	0	0	0	4	4	100	1
Total	0	0	4	8	8			
%				40	40			
% Sum					80	(N = 4)		

3d. Adequacy-PP (Program Planning Systems)

Country	VG	GD	AV	PR	VP	PR+VP	%	R
Belize	0	0	0	4	0	4	100	1
C.R.	0	0	0	0	4	4	100	1
E.S.	0	0	0	0	4	4	100	1
Guatemala	0	0	4	0	0	0	0	5
Honduras	0	0	0	2	2	4	100	1
Total	0	0	4	6	10			
%				30	50			
% Sum					80	(N = 4)		

(Table E.13 continued on following page)

Table E.13. (continued)

3e. R1 = Average of % PR+VP

Country	BU	NT	PM	PP	Avg.	R1
Belize	100	60	100	100	90	3
C.R.	71	100	100	100	93	1
E.S.	100	40	100	100	85	4
Guatemala	57	40	0	0	24	5
Honduras	86	80	100	100	92	2
Avg.	83	64	80	80	77	
Rank (R4)	1	5	2	2	4	
C.A. (*)	100	100	100	100	100	

* = As rated by ROCAP

3f. R2 = Avg. Ranks (R)

Country	BU	NT	PM	PP	Avg.	R2
Belize	1	3	1	1	1.50	1
C.R.	4	1	1	1	1.75	2
E.S.	1	4	1	1	1.75	2
Guatemala	5	4	5	5	4.75	5
Honduras	3	2	1	1	1.75	2

3g. R3=Avg.R1&R2

Country	R1	R2	Avg.	R3
Belize	3	1	2.0	2
C.R.	1	2	1.5	1
E.S.	4	2	3.0	4
Guatemala	5	5	5.0	5
Honduras	2	2	2.0	2

3h. Adequacy of Performance

Country	VG	GD	AV	PR	VP	PR+VP	%	R5
Belize	0	0	1	2	0	2	67	2
C.R.	0	0	1	0	2	2	67	2
E.S.	0	0	0	0	3	3	100	1
Guatemala	0	0	0	3	0	3	100	1
Honduras	0	0	1	2	0	2	67	2
Total				7	5			
%				47	33			
% Sum					80	(N = 3)		
C.A. (*)	0	0	0	3	0	3	100	

3i. Comparison of System Adequacy and Performance

Country	R3	R5
Belize	2	2
C.R.	1	2
E.S.	4	1
Guatemala	5	1
Honduras	2	2

Source: LAC/DR/RD Survey of LAC Mission Agricultural Research, Extension, and Education Projects/Programs, 1990 (See Survey Questionnaire for Each Area's N Attributes)

Table E.14. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to Public Sector Organizations in the Central American Region.

Key 3 = Major Constraint; 2 = Somewhat a Constraint
0 = Host country not seeking to improve public sector performance in this function

Constraint[5]	Belize	C.R.	E.S.	Guat	Hond	Avg.	Rank
a. Small Country Size	3	-	-	-	2	2.5	2
b. Weak Public Sector	2	3	2	-	3	2.5	2
c. Govt. Not Willing Fund REE	0	2	3	2	2	2.25	3
d. Lack Human Resources	2	0	3	-	3	2.67	1
e. Govt. Not See Benefit of Investing in REE	2	0	3	3	2	2.5	2
f. Lack of Technology Demand	0	-	-	-	-	-	-
Average	2.25	2.5	2.75	2.5	2.4	2.48	
Rank	4	2	1	2	3		

[5]Averages based on sum of item ratings in a row or column, divided by total number of items in row or column rated by Mission as "major constraint" (3) or "somewhat a constraint" (2).

Table E.15. Mission Ratings of Constraints (to Improving Agricultural REE) Internal to USAID/Country Mission in the Central American Region.

Key 3 = Major Constraint; 2 = Somewhat a Constraint

Constraint[6]	Belize	C.R.	E.S.	Guat	Hond	Avg.	Rank
a. Push toward Short-Term Projects	2	3	3	2	2	2.4	3
b. Private Sector Emphasis	-	-	3	2	2	2.33	4
c. Export-Led Development Strategy	-	-	3	3	-	3.0	1
d. Push toward Natural Resources	-	-	-	3	-	3.0	1
e. Mission Sees REE Separately	-	-	-	2	2	2.0	5
f. Mission Lacks REE Coordination Strategy	-	-	-	3	2	2.5	2
g. Mission Lacks Adequate Staff to Deal w/ REE	-	-	-	2	2	2.0	5
Average	2	3	3	2.4	2	2.46	
Rank	4	1	1	2	3		

[6]Averages based on sum of item ratings in a row or column, divided by total number of items in row or column rated by Mission as "major constraint" (3) or "somewhat a constraint" (2).

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ANNEX F
SUMMARY DESCRIPTION OF KEY AGRICULTURAL REE ORGANIZATIONS IN AID-ASSISTED LAC COUNTRIES.

This is a working document that was prepared to be one of the annexes to the *LAC/DR/RD Cross-Cutting Analysis of Agricultural REE in AID-Assisted LAC Countries.* The document provides summary information on key agricultural REE organizations and related AID-funded projects and organizations in AID-assisted LAC countries. Some data relating to National Agricultural Research Systems (NARS) were compiled from *ISNAR Agricultural Research Indicator Series: A Global Data Base on National Agricultural Research Systems* (ISNAR, 1989). Data on the use of "endowments" as a source of steady funding for AID-assisted agricultural REE organizations (e.g., an agricultural research foundation) is drawn from Gary Hansen's *Terms of Endowment: A New AID Approach to Institutional Development* (Hansen, 1990).

This document is now being revised and updated; thus, the reader may find that the descriptive information available in the present document may be incomplete for certain countries and/or organizations.

LAC REGIONAL ORGANIZATIONS

Inter-American Institute for Cooperation on Agriculture (IICA), San José, Costa Rica

The purpose of IICA, an international organization for technical cooperation and the strengthening of institutions in its 31 Member States, is "to encourage, promote, and support the efforts of the Member States to achieve their agricultural development and rural welfare." The Member States are: Antigua & Barbuda, Argentina, Barbados, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panamá, Paraguay, Perú, Saint Lucia, Saint Vincent & the Grenadines, Suriname, Trinidad & Tobago, United States of America, Uruguay, and Venezuela. IICA's program are divided into four areas: Caribbean Area, Central Area, Andean Area, and Southern Area.

The Inter-American Board of Agriculture (IABA), IICA's highest governing body, is comprised of representatives of all the Member States who meet every two years to approve policy guidelines and the two-year Program-Budget. These duties are performed through an Executive Committee comprised of representatives of 12 Member States, elected on the basis of rotation and geographical distribution. The General Director, the IABA's executive body, is made up of technical and administrative units responsible for coordinating and implementing IICA's programs in accordance with the policies established by the IABA.

IICA's activities are channeled through five Programs (agricultural policy analysis and planning, technology generation and planning, organization and management for rural development, marketing and agroindustry, and animal health and plant protection). These activities include direct advisory services to the governments and member countries, especially the ministries of agriculture and agencies concerned with these program areas; establishment of networks or multinational projects for the exchange of information among the countries, and for the implementation of programs of collaboration, by agreement among the countries; execution of technical cooperation projects.

IICA maintains an office and a representative in each of its member countries. This provides an institutional and administrative base for maintaining ties with government authorities; providing administrative and logistic support to the activities of IICA's Programs; executing projects which provide services in the countries; providing technical assistance to countries faced with unanticipated short-term problems; and developing project identification, management, and implementation skills.

IICA is operating under a Medium Term Plan (MTP) for 1987-1991 that is based on resolutions of the IABA, observed problems in the countries, and proposals of IICA's Director General. The MTP's objectives are stated in terms of "encouraging, promoting, and supporting the efforts of the Member States" to:

> Propel development of the agricultural sector as a source of economic growth, both as a supplier of foodstuffs for domestic consumption and as a major source of foreign exchange. Intensify modernization and increase production efficiency in the agricultural sector, and pursue regional integration.

The MTP outlines the following strategy meeting its goals:

> Concentration of efforts and technical leadership in a small number of subject areas of high priority. IICA's five Programs are the channel for carrying out such a strategy in this specific area and for Institute activities as a whole.
>
> Setting of priorities for those functions in which the Institute has clear operating advantages.
>
> Redesign of the operating structure to allow for concentration and technical ranking of activities in subject areas preselected for their high priority, and
>
> Increasing the supply and effectiveness of external resources for funding programs and projects.

IICA's Program II, Technology Generation and Transfer, promotes and supports actions to improve the design of Member States' policies on technology, strengthen the organization and management of their technology generation and transfer systems, and facilitate international transfer in this program area. Program IV, Marketing and

Agroindustry, identifies the promotion of non-traditional agricultural exports as a concentration area.

The Ninth Inter-American Conference of Ministers of Agriculture charged IICA to prepare a plan of joint action for agricultural reactivation in Latin American and the Caribbean. IICA prepared a "Strategy of Action for Reactivation of Agriculture in the Caribbean Countries" that proposes projects including: (1) a study of the potential for Caribbean-Latin American trade, joint venture investment, and cooperation; (2) strengthening the capabilities of farmers and farmers organizations; (3a) monitoring and evaluation of investments in agricultural research in the Caribbean; (3b) potential for applying biotechnology, particularly in micropropagation, pest management, and embryo transplant; (3c) development-support communication; (4) evaluation of alternative production models; (5) potential for university and agricultural institute graduates to become farmers; and (6) survey and monitoring of animal/plant diseases/pests in the Caribbean.

IICA's Investment Projects Center (CEPI) cooperates with the Member States and units of the Institute in the identification, formulation, administration, and evaluation of projects, and supports the formulation of IICA technical cooperation projects, training activities, and the design of relevant methodologies.

IICA's annual budget is financed through Member States quota payments and through funds received from other sources through agreements, donations, and contracts. Total quota payments in 1987 amounted to slightly over US$ 20 million; of this, the U.S. contribution was approximately US$ 13 million or slightly more than 60% of the quota budget. External resources income for the same year amounted to slightly more than US $15 million, the major part of which came from the U.S. through projects backed by government agencies and foundations.

A 1988 IICA publication notes that:

> While most of IICA's actions indirectly benefit the United States by improving productivity and raising the standard of living in rural areas, many of IICA's projects and programs have a far more direct impact on the U.S. Containment and eradication of plant and animal pests and diseases, efforts to teach correct use and regulation of pesticides, curbing the production of coca and other drugs through the introduction of viable alternative crops and the introduction of new agrotechnology are areas in which IICA is active and which directly benefit the United States.
>
> In the domain of plant protection, IICA is implementing projects to eradicate Mediterranean fruitflies in Central America and to prevent the introduction and possible spread of exotic diseases of Asian and African origin. It has established integrated pest control projects and offers extensive training of professionals in participating countries.
>
> Extensive efforts are being made by IICA in the region to regulate the use of chemical pesticides and to train people to correctly handle and apply these products.

Examples are IICA's contributions to the field of information and standardization in the labeling and use of pesticides.

A research project on pest control methods that can substitute for the pesticide EDB and a project to diagnose plant pests and diseases in the Caribbean are examples of activities being undertaken in this area by the Institute.

A marketing information project that affects both crop production and agricultural marketing is being undertaken by the Institute to promote exports from the Caribbean and Central America. The project provides producers with market-related information such as current prices and import requirements in the principal markets in the region.

IICA introduces higher levels of agrotechnology throughout the hemisphere, and in so doing opens markets for new technology, much of which originates in the United States. Higher levels of agricultural technology in Latin America and the Caribbean naturally create a growing demand for appropriate machinery and technology, for inputs associated with certified seed, for pesticides, fertilizers, semen and biotechnology, resulting in the opening of new markets for U.S. technology.

ANDEAN REGION

BOLIVIA

The primary national agricultural research organization is the Instituto Boliviano de Tecnología Agropecuaria (IBTA), while agricultural research in Santa Cruz department is carried out by the Centro de Investigaciones de Agricultura Tropical (CIAT).

Other research organizations are:

- Centro de Investigaciones Fitoecogenéticas
- Estación Experimental Abapo Izozog de las Fuerzas Armadas
- Several universities

ECUADOR

The primary national agricultural research organization is the Instituto Nacional de Investigaciones Agropecuarias (INIAP). Also there is a small forestry research institute, a publicly funded veterinary laboratory, and the Universidad Técnica de Machala with a faculty of Agronomy and Veterinary Medicine.

Foundation for Agricultural Development (FUNDAGRO)

In 1986, the Government of Ecuador (GOE) established the Foundation for Agricultural Development (FUNDAGRO) as a private, non-profit institution. FUNDAGRO's creation grew out of recommendations made by a high-level commission

established by the Minister of Agriculture and composed of distinguished U.S. and Ecuadorian agriculturists.

The GOE-operated agricultural research institute had, for many years, been constrained by political and administrative factors, including political interference, lack of links with farmers and the private agri-business sector, lack of long-term program planning, lack of public sector commitment to a strong research and extension program, low budgets, inability to focus scarce resources on priority research problems, and inability to recruit and retain highly qualified agricultural professionals. These kinds of problems also plagued the GOE's extension service and the country's agricultural higher education institutions. As a result, the country's technology generation and transfer (TG&S) system was not able to foster the technological innovation and transfer needed to improve productivity in Ecuador's agricultural sector.

FUNDAGRO grew out of a recognition of the need to revitalize Ecuador's agricultural research, extension, and education system. Further, there was recognition that any GOE institution would lack sufficient administrative and financial flexibility to take on the role of revitalizing the country's TG&T system. It was decide jointly by the GOE and USAID/Ecuador to establish FUNDAGRO as a private foundation, independent of the government, with the intent that this organization would provide leadership in developing stronger links between research, extension, and education in both the public and private sectors. It was assumed that this organization, with its own autonomous program and financial base, would be in a position to bring greater focus, coordination, and continuity in agricultural research, extension, and education.

The strategy for FUNDAGRO was to create a new integrated research/extension/education system, not by duplicating or displacing existing public or private research, extension, and education programs, but rather to serve as a catalyst to enhance interaction between such programs and to link them more directly to farmers as clients of research, extension, and education.

FUNDAGRO undertook this role by employing a small, highly qualified staff that works wish public and private institutions in the joint selection, planning, and funding of long-term, applied commodity research programs. As both a participant in and leader of this process, FUNDAGRO provides supplementary grants to support the activities of agencies working on these programs.

FUNDAGRO's operations were partially supported during its initial years by PL-480 local currency grants. In 1987, the GOE, FUNDAGRO, and USAID/Ecuador initiated discussions aimed at establishing an endowment for the foundation, in order to provide it with greater independence, flexibility, and continuity. Then, in 1988, FUNDAGRO was awarded a grant of funds (from the PL-480 local currency account) equivalent to US$ 3 million. The grant includes a provision that no withdrawals will be made from the endowment and its income for five years, in order to expand the principal. For the interim, USAID/Ecuador is providing an operational grant to assist in defraying FUNDAGRO's operational and program expenses.

The endowment grant agreement includes a matching formula as a condition to the endowment, with the GOE and USAID/Ecuador agreeing to provide an initial installment of 80% of the total grant, the remaining 20% to be allocated as determined by the PL-480 advisory committee, after FUNDAGRO undertook a market survey of private funding sources and submitted a fund-raising strategy. Also, a Development Officer, responsible for cultivating alternative in- and out-of-country funding sources, was appointed to the FUNDAGRO staff.

Management of the endowment is invested in a number of bodies within and outside FUNDAGRO. A four-person oversight committee, appointed by FUNDAGRO's Board of Directors, conducts an annual review of FUNDAGRO's obligations under the grant terms. This oversight committee is required to be comprised of persons who are high-level officials from international agricultural research centers, international PVOs, and third country foundations or development agencies with experience in Latin American agriculture. Lastly, the endowment grant agreement stipulates that FUNDAGRO will contract with an international financial services and/or accounting firm to assist in selecting a local bank and financial agent to manage investments in the endowment. Also, this firm will assist in carrying out an annual performance review of the selected bank and financial agent.

PERU

There have been numerous reorganizations of the Peruvian agricultural research system over the last 25 years, especially that part of the system under the responsibility of the Ministry of Agriculture (MOA). During the 1960s, agricultural research under the MOA was conducted by a semiautonomous organization (Servicio de Investigación y Promoción Agraria (SIPA). When SIPA was abolished as a semiautonomous institute in 1970, the research component was placed under the MOA, while the extension service was terminated. During the mid-1970s (circa 1975-76), the MOA was split into the Ministry of Food (MOF) and the Ministry of Agriculture (MOA), with the MOF taking over all food crop and commodity research, and the MOA taking over all research on industrial crops, natural resources, and irrigation. Then, in 1978, the two ministries were merged.

In 1978, the Instituto Nacional de Investigación Agraria (INIA) was created and assigned responsibility for all research previously conducted by the Dirección General de Investigación, Dirección de Investigación Forestral y Fauna, Sub Dirección de Investigación de Aguas y Suelos, and Instituto de Investigaciones Agroindustriales. In 1981, INIA's scope was expanded to include extension and the organization's name was changed to the Instituto Nacional de Investigación y Promoción Agraria (INIPA). However, research in the areas of forestry and fauna, water and soils, and agroindustry were removed from INIPA, and research in these areas was transferred to Instituto Nacional Forestal (INFOR), Instituto Nacional de Ampliación de la Frontera Agrícola (INAF), and Instituto Nacional de Desarrollo Agroindustrial (INDDA), respectively.

In 1987, INIPA's research component was merged with INDDA to form the Instituto Nacional de Investigación Agraria y Agroindustrial (INIA). Agricultural research is also conducted by the National Agricultural University (UNA) and by 15 regional universities.

Some agricultural research is conducted by some private institutes (e.g., Instituto Central de Investigaciones Azucareras, Hoja Peruana de Tabaco, and Instituo de Estudios Andinos).

In the early 1980s, Perú undertook a revitalization of the country's agricultural research and extension system. A large amount of financial assistance was proved by donors, including the USAID, World Bank, and Inter-American Development Bank, along with increased counterpart funds from local sources. Thus, the rapidly increasing levels of funding for agricultural research during the early 1980s followed a decline in real support during the 1970s. On the other hand, it should be noted that the hyperinflation experienced by Perú during the 1980s resulted in actual expenditures over the course of a year exceeding budgeted or proposed expenditures at the beginning of the fiscal year. It generally was the case that extra funds were made available to compensate public agencies such as INIPA for the declining purchasing power of their budget allocations.

CARIBBEAN REGION

CARIBBEAN REGIONAL INSTITUTIONS

Caribbean Agricultural Research and Development Institute (CARDI), University Campus, St. Augustine

The mission statement of CARDI is: "To contribute to agricultural development through the generation and dissemination of appropriate technology that benefits the Caribbean people." CARDI is the main sub-regional agricultural research organization in the Caribbean, with a field presence in all English-speaking Caribbean countries and area offices in Barbados, Antigua and Barbuda, and Jamaica. CARDI was established in 1975 to serve the agricultural research and development needs of Member States of the Caribbean community (Antigua & Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts/Nevis, St. Lucia, St. Vincent & the Grenadines, and Trinidad & Tobago). CARDI's operational strategy is based on two major premises: (1) technology is a major constraint to improved productivity and greater efficiency in Caribbean agriculture; and (2) CARDI's primary role is to supply this technology in key crops and animal production enterprises, especially in the lesser developed member states.

Under the Regional Food and Nutrition Strategy (RFNS), the region's major agricultural policy instrument, CARDI is working to achieve regional food self-sufficiency by reducing dependence on imported food, to increase foreign exchange earnings through increased exports of food commodities, and to improve income and productivity in the agricultural sector.

Faculty of Agriculture, The University of the West Indies (UWI), St. Augustine, Trinidad and Tobago

The Faculty of Agriculture of The University of the West Indies (UWI) is the main degree-granting educational institution in the English-speaking Caribbean. The university recently restructured its training program to offer two technology-oriented B.Sc. degrees

(Crop Production and Livestock Production), new M.Sc. programs in selected areas of identified need; and a Continuing Education Programme in Agricultural Technology (CEPAT) of technology-oriented short courses in selected areas of identified need. The new M.Sc. programs include Plant Protection and Post-harvest Biology and Food Science, while M.Sc. programs are being developed in Soil and Water Management and Agribusiness. A special administrative unit, the Tropical Agricultural Technology Training Unit (TATTU), has been established in the Faculty of Agriculture to administer a Continuing Education Program in Agricultural Technology (CEPAT) courses at the farmer, vocational, diploma, undergraduate, and postgraduate levels.

DOMINICAN REPUBLIC

The primary national agricultural research organization is the Departamento de Investigación Agropecuaria (DIA), Secretaría de Estado de Agricultura (SEA), the Ministry of Agriculture. The DIA finances all research institutes under the jurisdiction of SEA, including:

- Consejo Estatal de Azúcar-Centro Dominicano de Investigación Pecuaria con Caña de Azúcar (CEA/CEDIPCA)
- Consejo Estatal de Azúcar-Centro de Investigaciones en Caña de Azúcar (CEA/Duquesa)
- Centro de Investigaciones Arroceras (CEDIA)
- Centro Norte de Desarrollo Agropecuario (CENDA)
- Centro de Investigaciones Pecuarias (CENIP)
- Centro de Investigaciones Aplicadas a Zonas Aridas (CIAZA)
- Universidad Autónoma Santo Domingo (UASD)

Superior Institute of Agriculture (Instituto Superior de Agricultura, ISA), Santiago

The Superior Institute of Agriculture (ISA) is the D.R.'s premier undergraduate agricultural college. As a private, non-profit educational and research institution, ISA cannot rely on Government of the Dominican Republic (GODR) funding; rather ISA must depend upon diversified sources of self-generated income for financial sustainability. One source is tuition fees but many ISA students, coming from poor rural households, are only able to study at ISA through ISA-provided tuition subsidies.

While there is a growing demand from the D.R.'s private sector for technicians and researchers to support a growing non-traditional agricultural export (NTAE) sector, the D.R's institutions of agricultural higher education lack sufficient financial resources to reorient their research and training to meet this demand. To respond to this need, USAID/Dominican Republic (USAID/DR) and the GODR reached an agreement in 1989, to provide ISA with a large grant that would be used to enhance ISA's capacity to carry out education and research on NTAE crops.

The agreement included provision of both project funds (immediately available for use by ISA) as well as local currency funds that were used to provide initial funding for an

endowment, the earnings from which are to be used to help sustain ISA's NTAE programs, once the supporting USAID/DR project ends. The project grant was designed to assist ISA in refurbishing and expanding ISA's infrastructure (laboratories, equipment, supplies, library materials), and fund new research and education programs. The grant also provide funds to expand the faculty and to increase substantially faculty salaries, a measure designed to reverse a trend of migration of faculty to the private sector in search of higher salaries.

The endowment portion of the GODR/AID agreement provided the equivalent of US$ 15 million in Economic Support Funds (ESF) generated local currency to establish an endowment that would provide the potential of building a more self-sustaining income based for ISA. Income from the endowment is to be reinvested to expand the endowment capital for the duration of the USAID/D.R. project (7 years), with income from the endowment being available thereafter to help meet ISA expenses.

Because the income from the original GODR/AID endowment along would not be sufficient to meet all of ISA's expenses, the USAID/D.R. project grant also included provision of funds to establish a development office and retain technical assistance to help in the formulation of a long-range strategy to mobilize funds from domestic and external sources. Potential sources include cash contributions, asset transfers (e.g., properties and annuities), endowed chairs, alumni contributions, debt-equity swaps, grants, etc.

Fiduciary responsibility for the endowment is vested in ISA's Board of Directors. The board is comprised of leaders from business and civic organizations as well as representatives of government agencies.

HAITI

The primary national agricultural research organization is the Agricultural Research and Documentation Center (CDRA).

JAMAICA

Up until the end of the 1970s, agricultural research at the national level primarily was carried within the Ministry of Agriculture (MOA); however, agricultural research within the MOA "virtually collapsed at the end of the seventies because of political instability, and it seems to have been in a state of reorganization since that time" (ISNAR, 1989:251). Research has been carried out by the following agencies and/or dependencies of the MOA:

- Banana Industries Board
- Coconut Industries Board
- MOA - Crop & Soils Research
- MOA - Livestock Research
- MOA - Fisheries Research
- MOA - Forestry Research
- Sugar Industries Research
- Scientific Research Council

Research also has been carried out by the Caribbean Agricultural Research and Development Institute (CARDI).

OECS States--Antigua, Dominica, Montserrat, St. Kitts-Nevis, St. Lucia, and St. Vincent

The principle agricultural research organization in the OECS States is the Caribbean Agricultural Research and Development Institute (CARDI). In 1966/67, the then Regional Research Center (RRC) was merged with the University of the West Indies (UWI); then, in 1975, the RRC was detached from UWI and transformed into CARDI, with CARDI being given a decentralized structure and research units in each of the member countries.

- Antigua: Prior to 1975, agricultural research was carried out by the Agricultural Department of the Ministry of Agriculture. With the creation of the Caribbean Agricultural Research and Development Institute (CARDI) in 1975, CARDI took over the lead role for conducting agricultural research on Antigua.

- Dominica: Agricultural research is engaged in by Ministry of Agriculture personnel as well as by CARDI and French Technical Cooperation Group personnel.

- Montserrat: Agricultural research is only conducted by the CARDI unit at Montserrat; no other organizations conduct agricultural research on the island.

- St. Kitts-Nevis: CARDI is the only organization conducting agricultural research on the island.

- St Lucia: Agricultural research through 1975 was conducted by the Ministry of Agriculture and by the Windward Islands Banana Growers Association (WINBAN), headquartered at St. Lucia. Today agricultural research is conducted by MOA, WINBAN, and CARDI researchers. Some research also is done by a French mission.

- St. Vincent: Some agricultural research has been conducted over the past 25 years by the Department of Agriculture in collaboration with CARDI. WINBAN conducts trials on St. Vincent.

CENTRAL AMERICAN REGION

CENTRAL AMERICAN REGIONAL INSTITUTIONS

Tropical Agricultural Research and Training Center (CATIE), Turrialba, Costa Rica

CATIE is an autonomous regional institution devoted to research and education for agricultural development and integrated management of natural resources in the organization's 7 member countries--the Dominican Republic and six Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panamá).

CATIE's mandate includes: scientific research in agriculture and natural resources in the American Tropics, particularly Central America and the Caribbean; and education in agricultural sciences and natural resources through graduate studies leading to a M.Sc. degree. While CATIE's research mandate is limited to the organization's 7 member countries, CATIE has a Latin American mandate in education (graduate degree and continuing education levels). About 1,000 students have earned a Master's degree since 1944. Some 5,500 participants have attended short courses and seminars offered since 1974 by CATIE (over 10,000 since 1944).

CATIE seeks to:

- Measure the center's impact in terms of development--improving the people's standard of living, particularly the poor rural families, rather than in terms of the number of varieties released or the number of people trained.

- Develop agricultural technologies (improved varieties and practices) aimed at increasing and sustaining productivity and, hence, improving nutrition, health, and income.

- Increasing, through training and technical assistance, the supply of skills and experienced scientists and technicians to carry out research, make the research findings available to farmers, and promote a policy environment to support and encourage the adoption of improved technologies.

CATIE's Board of Directors approved in November 1987 a medium-term (1988-1997) institutional development strategy and plan to link production and productivity with conservation of natural resources aimed at sustainable agricultural development, and research and educational activities with efforts oriented to agricultural growth and development. Also, CATIE is seeking to establish a Regional Agricultural Research and Education System.

CATIE has identified research and educational priorities which have been incorporated into three interactive research and development programs: (1) Tropical Crops Improvement, (2) Sustainable Agricultural Production and Development, and (3) Integrated Natural Resources Management.

The Tropical Crops Improvement program is aimed at (a) improving coffee, cacao, and plantain through obtaining more productive and disease resistant genetic material; (b) collection, maintenance, evaluation, and distribution of promising tropical plant genetic resources; and (c) technology development through emphasizing research on critical components limiting production of these tropical crops.

The Sustainable Agricultural Production and Development program is aimed at (a) developing technology through emphasizing research on critical components limiting production of annual food crops (rice, corn, beans, sorghum), livestock (meat and dairy bovine cattle), and forestry; (b) development of improved economic and sustainable

production systems aimed at integrated regional development; and (c) development of improved methods for agro-technology transfer and utilization by farmers.

The Integrated Natural Resources Management program is aimed at (a) providing general biophysical and socio-economic information to support integrated regional resources management; (b) conducting appropriate planning of regional natural resources utilization as a basis for the development of sustainable production systems; (c) providing information and assistance on conservation of regional natural resources (soil, water, forests, biological diversity); (d) conducting research on resources management. One of CATIE's newest projects (USAID/ROCAP-funded RENARM), will strengthen CATIE's watershed management, integrated pest management, and agro-forestry programs.

CATIE has played a lead role in developing the "Regional Cooperative Network for Education and Training in Agricultural and Renewable Natural Resources (REDCA)," involving more than 60 institutions of higher education, ministries of agriculture, research institutes, and national councils on higher education in seven member countries. The purpose of this network is "To contribute to improve the quality of research, higher education, training and extension concerning agricultural matters and natural resources for an accelerated and sustained development." Through the operation of this network, CATIE seeks to strengthen the national research and educational institutions, and contribute to the formation of human resources needed for accelerating and sustaining development in the region. REDCA's sub-network of U.S. universities include the University of Wisconsin, Cornell University, Iowa State University, University of Florida, Colorado State University, and the University of Missouri.

CATIE's present financial structure is approximately 75% special projects and 25% core funds. CATIE's core budget is formed by the individual contributions of member countries and IICA on annual basis, special projects' overhead charges, and some productive commercial activities.

Pan American Agricultural School (Escuela Agrícola Panamericana, EAP) El Zamorano, Honduras

The Pan American Agricultural School (EAP or Zamorano), located in Zamorano, Honduras, was established in 1942, as a private, non-profit, post-secondary school to train agriculturists throughout the LAC region. The school is a degree-granting agricultural college which offers a general "agrónomo" degree in tropical agriculture at the completion of 3 years, while the specialized "ingeniero agrónomo" degree requires one additional year. Each year about 110 "agrónomo" and 60 "ingeniero Agrónomo" degrees are granted. EAP's mission is:

> to provide the highest quality agricultural education through practical training, at the university level, to Latin American youth, with an emphasis on the life-enduring habits of honesty, hard work, personal discipline, and confidence in one's professional capacity. Zamorano graduates are taught to have the farmer's persistence, commercial viability, and a philosophical attitude so they will not abandon their

mission as food producers as they move into careers in both public and private sectors."

The academic program is structured to provide "hands-on" learning by doing training. Academic work includes theory and practice and is divided equally between the classroom and field. The academic year is an 11-month, in-residence program with an intensive dawn-to-dusk schedule of class work and field studies. Each student, in addition to classroom instruction, works under instructors 4 hours a day, 6 days a week, in the field, thereby acquiring knowledge and skills in all aspects of tropical agriculture, including research, production, processing, marketing, and distribution of product. Each student follows the same prescribed courses; electives are allowed only after the third year.

The school's faculty is engaged in a variety of research activities, including integrated pest management. In recent years, Zamorano has expanded extension services and non-formal educational opportunities. The College annually trains hundreds of technicians, farm managers, and small farmers through field demonstrations and short courses.

The school was able to cover its finances from 1942 through 1957 from a trust fund established by the United Fruit Company, thereafter from supplementary funds generated from student fees, private and public donations, and from sales of products grown at the school. In 1988, 29% of EAP's budget came from the sale of commercial farm produce (e.g., corn, milk, cheese, eggs, and certified seed). EAP's current operations are supported through tuition, farm sales, and funds given by donors, including the U.S. and German governments, multinational corporations, several private foundations, and U.S. and Latin American citizens.

The growing importance of EAP to the region and the desire that the school assume an increasing range of education and research responsibilities led to an initiative to expand the school's financial base. In 1987, EAP initiated discussions with USAID/Honduras and the Government of Honduras (GOH) to explore the possibility of obtaining an AID grant to expand the school's endowment and the income therefrom. These discussions led to a project agreement to provide EAP with an equivalent of $US 15 million in Economic Support Funds (ESF) generated local currency, provided that matching funds (25% of US$ 15 million) are obtained from the private sector. Since the ESF account already was part of a stabilization and recovery program being supported by an USAID/Honduras project, already approved by the GOH, additional legislative action to ratify the endowment was not required. New funding under the endowment will supplement existing endowment funds managed by the school's Trustees.

A formal Memorandum of Understanding (MOU) between EAP, the GOH, and USAID/Honduras stipulates that the grant funds be invested only in short-term (3-5 year) general revenue GOH bonds issued through the Central Bank of Honduras. Further, EAP is required to keep the endowment capital intact; in other words, capital in the endowment can only be used for reinvestment. A clause in the MOA makes the endowment irrevocable and non-reimbursable, with any proposal for its dissolution subject to proceedings and laws of the judicial system of the GOH.

The MOA stipulates that, during the MOU's term (which expires in eight years), reinvestment of the GOH grant into securities other than GOH bonds can only be done after consultation with the GOH, in order to ensure that reinvestments are consistent with the GOH's economic stabilization and recovery program. After this eight-year period, EAP is free to convert the bonds to other domestic and/or foreign investments. Also, the MOA authorizes EAP to use up to 70% of the endowment's income to cover the costs of education for Honduran students and the remainder for natural resource management programs undertaken by EAP in the region where the school is located. This condition holds in perpetuity.

Also included in the MOA is a 25% matching requirement to provide an incentive for EAP to mobilize funds from other sources. The matching formula provides for the local currency endowment to be released in three equal installments. The second installment can only be released to EAP once the school has demonstrated that it has met the first installment's 25% match, and the third installment is only released when the 25% match is met on the second installment. Further, income generated from the first installment cannot be used by the school until it has met the matching formula for the second installment. This rule also applies to the second and third installment.

The matching formula also includes the provision that no less than half of the 25% match can be in cash (local currency or U.S. dollars), with the other allowed in kind (land, buildings, equipment, vehicles). Finally, the MOU's restrictions on portfolio investments (i.e., the purchase of government bonds) and the use of generated income therefrom (for Honduran students and natural resource management programs) do not apply to funds or assets generated by matching contributions to the GOH/AID local currency grant.

Also stipulated in the MOU is the provision that EAP's Board of Trustees will serve as the trustees for the endowment. This board is required to select, after careful review and consultation with the GOH, a depository institution to assume custody of the funds and to disperse to EAP income endowment-generated income. The Board meets twice a year, has 22 active members, seven of which are Hondurans and 15 citizens of the U.S.

Agricultural College of the Humid Tropical Region (Escuela de Agricultura de la Región Tropical Humeda, EARTH), Costa Rica

A growing concern in Central America over declining or stagnant production levels in basic food and export crops, the lack of crop diversification, and the degradation of the natural resource base, especially in the lowland humid tropics, led the Government of Costa Rica (GOCR) and AID to agree in 1986 to jointly fund establishment of the Agricultural College of the Humid Tropical Region (EARTH). EARTH's mandate is to serve as a four-year agricultural university that will focus primarily on agricultural education and increase the supply of trained agriculturists at the B.Sc. level; however, the school eventually may develop a program of research on humid tropics agriculture. For the present, EARTH's academic program is being developed by the California State Polytechnic University, San Luis Obispo. The curriculum will emphasize "hands on" learning-by-doing training on a

number of tropical horticultural commodities. Construction of the school's campus began in 1986, and the first class of students registered and began their studies in March 1990.

EARTH was chartered as a private, non-profit institution; thus, the school is free to design its own program and to hire, compensate, and dismiss its faculty according to the guidelines established by the school's Board of Directors. The school's primary funding base will be tuition fees, income generated from the school's farm, monies raised through the school's own fund-raising campaigns, and a large endowment. This endowment follows from an agreement between the GOCR and AID for an equivalent US$ 60 million in Economic Support Funds (ESF) generated local currency to be invested in an endowment. Most (US$ 50 million) of the local currency is invested in monetary stabilization bonds issued by the Central Bank of Costa Rica.

The agreement for the endowment also requires that US$ 10 million in ESF local currency be converted to dollars and placed in a U.S. trust account. Interest earned on this U.S. account is to remain in the account for the first ten years, in order to expand the endowment. During the 10-year interim, the dollar costs of equipment purchases, salaries for foreign faculty, etc. will be financed by a grant (US$) through an AID project.

Non-Traditional Agricultural Export Support Project (PROEXAG), Guatemala City, Guatemala

The development of non-traditional agricultural export (NTAE) crops from Central America is supported by a $7.2 million USAID/ROCAP-funded project spanning a five year period (1986-1991). The purpose of PROEXAG is to create and/or strengthen private sector capabilities through the provision of "hands-on" training and technical skills related to production technologies and market intelligence for NTAE crops. The project assists the export federations within four Central American countries (Costa Rica, El Salvador, Honduras, and Guatemala) in developing their capacity to develop a successful and self-sustaining horticultural crop export market. Priority crops are: melons, berries, asparagus, cut flowers, exotic flowers, specialty vegetables, mangoes, cucumbers, and processed tropical fruits. Assistance is provided in all aspects of production, pest management, post-harvest handling, transportation, and market penetration.

BELIZE

The primary national agricultural research organization is the Ministry of Natural Resources (MNR) which contains the Department of Agriculture-Research Division (DOA/RD) and the Toledo Rural Development Project (TRDP) which conducts research on rice. The Caribbean Agricultural Research and Development Institute (CARDI) also conducts agricultural research in Belize.

Two private agricultural research institutes operate in Belize: the Sugar Cane Research Station of the Belize Sugar Industries Ltd., and Caricom Farms Ltd.

COSTA RICA

The primary national agricultural research organization is the Dirección General de Investigaciones Agrícolas (DIA) of the Ministry of Agriculture and Livestock (MAG). Research primarily is conducted on crops, while livestock and forestry research is done by the MAG's Livestock Department and Forestry Department, respectively. At least 10 other organizations (e.g., the Asociación Nacional Bananera and the University of Costa Rica) are to some extent also involved in agricultural research.

Coalition for Development Initiatives/Agricultural Division (CINDE/DIVAGRI) [formerly the Consejo Agropecuario Agroindustrial Privado (CAAP)], San José, Costa Rica

In 1982, the Government of Costa Rica (GOCR) and USAID/ Costa Rica reached an agreement to establish the Coalition for Development Initiatives (CINDE), as a private, non-profit foundation. The foundation's mandate is to promote foreign investment, agricultural exports, industrial reconversion for export, and export-oriented training. DIVAGRI, CINDE's Agricultural Division, seeks to develop a sustainable horticultural crop export industry in Costa Rica, and to improve the quality of export products. The organization has four primary objectives:

1. To serve as a lobbying group to initiate policy reform and/or promote policy dialogue with various GOCR institutions within the agricultural sector that either directly or indirectly influence agricultural production, exports, and investment.

2. Promote agricultural and agribusiness export and investment projects and secure necessary financing.

3. Design and implement an export and investment and promotion strategy aimed at achieving increased levels of foreign exchange earnings, employment, and agricultural/agroindustry exports.

4. Establish and manage a development fund to finance policy studies, product feasibility studies, institutional studies and product assistance programs that foster agricultural development and exports.

CINDE/DIVAGRI is following a five-year strategy that focuses on lobbying, product development, and implementation of agricultural export and investment and export promotion.

CINDE/DIVAGRI seeks to develop a strong, effective, and sound marketing base for the export of non-traditional products seen as having the greatest potential to compete successfully in foreign markets (ornamentals, flowers, strawberries, melons, cacao, macadamia nuts, industrial tomatoes, asparagus, black pepper, and mango/papaya. Ornamental plant, flower, and strawberry projects have been implemented, and a pilot melon

project was initiated in 1988 with six small growers. However, the remaining target crops are still in developmental stages.

CINDE/DIVAGRI currently works to develop non-traditional agricultural export crops by assisting growers in crop production, pest management, postharvest handling, and marketing. The organization receives considerable support from long- and short-term PROEXAG specialists who work with CINDE/DIVAGRI extension specialists on crop-specific problems. These specialists provide assistance through training courses and field-level transfer of production technologies to the farmer's fields.

CINDE/DIVAGRI provides funds to the University of Costa Rica (UCR) for production and processing research on NTAE crops, including soil and plant tissue analysis for private growers. Food processing research is also being initiated with UCR. Linkage is strong with the UCR but not with CATIE or IICA. The organization has worked closely with the Chamber of Commerce to develop the air transportation infrastructure for perishables.

CINDE/DIVAGRI has established offices in Miami and Europe to foster U.S. and European market penetration of Costa Rican products. The offices primarily are involved in promoting Costa Rican fruits, vegetables, and flowers, and establishing contacts with importers and governmental regulatory agencies.

DIVAGRI's parent organization, CINDE, was created in response to previously unsuccessful efforts by the GOCR to promote trade and investment through public sector organizations. These latter institutions performed less than optimally because salaries were too low to employ a high-level staff, management flexibility was constrained by bureaucratic rules, and operational decisions frequently were subject to political interference. CINDE was established as a private organization having sufficient autonomy and flexibility to overcome many of the obstacles that public sector trade and investment promotion organizations had suffered.

In CINDE's initial years of operation, its program costs primarily were funded by Economic Support Funds (ESF) generated local currency grants. But facing a projected decline in ESF levels, the GOCR proposed in 1989 that an endowment of US$ 110-120 million be established, the income from which would adequately fund most of CINDE's activities.

USAID/Costa Rica, responding favorably to this proposal, subsequently entered into an agreement with the GOCR to allocate an initial equivalent of US$ 27.15 million in Economic Support Funds (ESF) generated local currency to the endowment, with an additional ESF local currency grant of $US 45 million in the following years. Also, the Costa Rican Central Bank is providing annual contributions of US$ 3.5 million for a twenty year period. Additional operating expenses for CINDE will be covered thorough user fees and private contributions.

Given the endowment's size and the need to ensure that CINDE's program are insulated from non-technical considerations, but are yet accountable to performance targets, the endowment's management includes an elaborate set of checks. The ownership, control, and programming of the endowment is vested in a Board of Governors, established independently from CINDE. The GOCR and the donors, including USAID/ Costa Rica, in rough proportion to the size of their contributions to the endowment, nominate and select the members of the Board. The Board, which is responsible for monitoring the performance of CINDE's programs, has the authority to vary individual program funding by up to 20%, and has the authority to terminate funding of any CINDE programs. This decision can be reverse only be agreement between the GOCR and participating donors. Programming changes proposed by the Board, the GOCR, or USAID/Costa Rica is subject to approval by the GOCR and USAID/Costa Rica.

Further, these checks are reinforced by administrative and financial controls, including the requirement for USAID/Costa Rica prior approval of not only the design of financial systems, cash management, and disbursement policies for the endowment, but also the financial controls of CINDE's program operations. Also, annual independent audits of CINDE's financial, administrative, and procurement systems, and the programs financed by CINDE, will be conducted by public accounting firms approved by the GOCR and USAID/Costa Rica, while USAID/Costa Rica can conduct its own audits or evaluations of the endowment and CINDE's programs.

Finally, the endowment agreement with the GOCR provides for the dissolution of the endowment in 1996. After this date, the endowment can be continued only if there is a positive determination by the GOCR, USAID/Costa Rica, and other participating donors that continuation of the endowment is warranted. Otherwise, the endowment reverts to the treasury of the GOCR or be reallocated to other development activities.

To avoid inflationary impact, funds invested in the endowment are to be placed in monetary stabilization bonds issued by the Central Bank. Thereafter, the funds will be moved into private investments. Also, the agreement with the GOCR provides for a portion of the interest earned to be converted into foreign currency in order to support CINDE overseas investment promotion.

EL SALVADOR

The primary national agricultural research organization is the Research Division of the Centro Nacional de Tecnología Agropecuaria (CENTA), Ministry of Agriculture and Livestock (MAG). CENTA was established in 1972, when the research responsibilities previously performed by MAG's former Directorate of Agricultural Research were integrated into CENTA, along with other ministry activities such as seed production, extension, and agricultural education. Then, in 1977, education was separated from CENTA. In 1982, there was an initiative to integrate CENTA and research under the other directorates of MAG into a new agency called the Instituto Salvadoreño de Investigaciones Agrarias y Pesqueras (ISIAP). However, this attempt did not succeed and only the name of CENTA was changed into Centro de Tecnología Agrícola, although the same acronym (CENTA) is still used. In

1986, the agency's agricultural division was removed CENTA, leaving only research and seed production in the center's mandate.

Several other directorates of the MAG also conduct research or have a research institute, including the Instituto Salvadoreño de Investigaciones del Café (ISIC), the Centro de Desarrollo Pesquero (CENDEPESCA), the Centro de Recursos Naturales (CENREN), and the Centro de Desarrollo Ganadero (CDG).

Private organizations involved in agricultural research include FUSADES/DIVAGRO (see below), the Faculty of Agriculture of the El Salvador University, the Cooperativa Algodonera, and INAZUCAR.

FUSADES/DIVAGRO

The Agricultural Division (DIVAGRO) of the Salvadoran Foundation for Economic and Social Development (FUSADES). DIVAGRO was established through a USAID grant provided under the Agrarian Reform Sector Support project (519-0265) to FUSADES for an agricultural diversification program (ADP). Under the grant, FUSADES was to organize the ADP; establish a data base of information on agribusiness and agricultural diversification opportunities/resources; disseminate this information to the general public; and administer a fund to finance pre-investment feasibility studies along with short-term TA to producers of nontraditional agricultural products.

Escuela Nacional de Agricultura (ENA)

USAID/El Salvador, the GOES, and the Fundación Empresarial para el Desarrollo Educativo (FEPADE) are developing a strategy and program to privatize the National Agricultural School (ENA). Information about ENA and the ENA privatization strategy are presented in "Terms of Reference for the Process to Privatize El Salvador's National Agricultural School (ENA)" (Byrnes, 1990b).

GUATEMALA

The primary national agricultural research organization is the Instituto de Ciencia y Tecnología Agrícola (ICTA). Agricultural research also is conducted by the following: Comisión MOSCAMED, Asociación Nacional del Café, Instituto Nacional Forestal (INF), and Comisión México-Guatemala pra el Control de la Roya del Cafeto, and Instituto de Nutrición de Centro América y Panamá (INCAP). While primarily an educational institution, some research is conducted at the Instituto de Investigaciones Agronómicos (IIA).

HONDURAS

The primary national agricultural research organization is the Programa Nacional de Investigación Agropecuaria (PNIA). Agricultural research also is conducted by the following organizations:

- Corporación Hondureña del Banano (COHBANA)
- Corporación Hondureña para el Desarrollo Forestal (COHDEFOR)
- Ingenios Azucareros (IA)
- Instituto Hondureño del Café (IHCAFE)
- Instituto Nacional Agrario (INA)
- Standard Fruit Company (SFC)
- Servicios Internacionales de Agricultura Tropical S.A. (SIATSA)
- Tabacalera Hondureña (THSA)

Honduran Agricultural Research Foundation (Fundación Hondureña de Investigación Agrícola, FHIA), La Lima, Honduras

The Honduran Agricultural Research Foundation (Fundación Hondureña de Investigación Agrícola, FHIA) was established in La Lima in 1984 as a private non-profit foundation. FHIA's capital facilities (land, buildings) were donated to the foundation by the United Brands Company. The facilities formerly were used by that company's Division of Tropical Research. To provide a base of initial funding support, USAID/Honduras awarded FHIA a 10-year grant to cover the foundation's operation and program expenses.

FHIA's mandate is to foster expansion and improvement of technology generation and transfer responsive to the production needs and export opportunities of small, medium, and large farmers throughout Honduras. The Foundation has the following objectives:

1. Conduct agricultural research on traditional and non-traditional crops produced for domestic consumption and for export (production, processing, and marketing, both national and international);

2. Provide laboratory and related services for this research;

3. Advance the nation's agricultural development through science and technology;

4. Maintain communication services to support the farmers and agricultural extension;

5. Obtain funding for operating regional- and international-level programs and projects on the genetic resources of bananas, plantains, and related species, and also for the regional citrus certification project. (Objectives of the banana and plantain breeding program are to develop resistance to nematodes, Sigatoka, and Fusarium, and to increase yield and quality.)

FHIA's research programs are primarily commodity-oriented (vegetables, cacao, plantain, banana, and citrus). A Diversification Program is looking for new production and export alternatives (soybeans, mangoes, spices, palm-hearts, black pepper, specialty citrus, pineapple, and other non-traditional export crops). FHIA operates four crop-oriented experimental stations, including one for mangoes and vegetables at Comayagua. The Communication Division produces and shares information with national and international research institutions involved in related research. The division works with the MRN and National

Agrarian Reform Institute to disseminate research information via on-farm trials, training, publications, newspapers, and other media.

Through the FHIA's Board of Directors, the Honduran private sector, small farmers' groups, and other technology users play a role in determining FHIA's research program. FHIA's is governed by a General Assembly that meets annually. The General Assembly is comprised of private citizens and government officials who are concerned with agricultural research and extension in Honduras. A nine-member Administrative Council meets bi-monthly.

To ensure FHIA's long-run sustainability, USAID/Honduras has been working with FHIA to seek additional resources through a financial development program. A key component of this program has been an effort to create an endowment of sufficient size to meet FHIA's core operational and program expenses. A Memorandum of Understanding (MOU) between the Government of Honduras (GOH), USAID/Honduras, and FHIA will vest fiduciary responsibility for the endowment in the Administrative Council.

The initial source of funding for the endowment is Economic Support Funds (ESF) locally generated currency. The MOU requires that the endowment be invested in general revenue bonds of the GOH. To ensure that any reinvestments of earnings (on the ESF-contributed part of the endowment's capital) in investments other than government bonds are consistent with GOH economic stabilization policies, the MOU requires that such reinvestments must be done in consultation with the GOH.

Funds for the endowment will be released in three tranches. A matching formula requires FHIA to contribute 10% of the total $60 million endowment. This matching provision, in effect, is an incentive for FHIA to expand the endowment, and also to motivate FHIA to build a constituency that will assist is developing the foundation's long-term financial sustainability.

FHIA can meet the matching requirement through either case or in-kind contributions. But the MOU stipulates that no more than half of these contributions can be in the form of capital assets (buildings, land, equipment, etc.) and that half of the contributions must be made in the form of contributions to FHIA's endowment. For contributions made in foreign currencies such as U.S. dollars, FHIA will receive double credit on the match.

Further, the MOA provides FHIA with a three-year time period to meet the matching requirement for each of each of the three installments. During each three-year time period, the interest earned for each installment must be reinvested in the endowment until the match contribution is fulfilled; at that point, any earnings can be used to meet core program and operating expenses. If the match is not made by the end of each three-year period, the GOH has the right to reclaim the interest that has been earned on that period's installment.

The MOA requires that earnings on GOH/AID contributions to the endowment be spent on the core operational and program expenses specified in the MOA. Further, if FHIA wishes to alter the agenda of core expenses, the GOH and USAID/Honduras must first be

consulted. But FHIA may spend at its own discretion any earnings from FHIA matching contributions. Also, any matching contributions designated as an endowment donation can be invested by FHIA in government or non-government investments.

The respective roles of the GOH and USAID/Honduras in the governance and management of FHIA are spelled out in the MOU. USAID/Honduras is an official member of FHIA's General Assembly and Administrative Council, while the GOH is an ex-officio member of these bodies. FHIA must submit semi-annual financial reports to the GOH,. employ a certified public accounting firm acceptable to the GOH, and submit annual audit reports to the GOH.

Federación de Asociaciones de Productores y Exportadores Agropecuarios y Agroindustriales de Honduras (formerly, FEPROEXAAH, now FPX), San Pedro Sula, Honduras

FPX is a private agricultural export development organization, initiated with USAID/Honduras funding support. FPX was designed to promote and support development of non-traditional agricultural and agroindustrial exports, with an emphasis on marketing of fruits, vegetables, and ornamentals. Product managers are responsible for developing a diversity of crops with an existing exportable base: cacao, cardamom, cashew, cucumbers, cultivated shrimp, melons, ornamentals, peppers, pineapples, plantains, tomatoes, flowers, passion fruit, and berries.

FPX provides growers/exporters with assistance in identifying promising export projects, developing financial packages for private bank financing, and assisting exporters in all phases of post-harvest handling, transportation, and international marketing.

FPX has about 70 employees in San Pedro Sula; FPX also operates an office in Miami to strengthen ties between Honduran growers and U.S importers.

Little or no cooperative research is done between FPX and Zamorano, or between FPX and FHIA. FPX has drawn to a limited extent on technical assistance support from PROEXAG.

NICARAGUA

Agricultural research under the "Ministry of Agriculture" (or whatever other name it may have had) has been moved quite often, over the last 10-15 years, within the ministry's changing organizational structure. Agricultural research, which had been a directorate of the Ministry of Agriculture (MOA) until 1976, was moved that same year to a semiautonomous institute called the Instituto Nacional de Tecnología Agropecuaria (INTA). But INTA was abolished in 1980, when agricultural research was assigned to the Dirección General de Tecnología Agropecuaria y Reforma Agraria. A further reorganization took place in 1984, when agricultural research was moved to the Dirección General de Agricultura.

PANAMA

The primary national agricultural research organization is the Instituto de Investigación Agropecuaria Panamá (IDIAP). Agricultural research also is conducted by:

- United Fruit Company
- Compañía Panameña de Alimentos (NESTLE)
- Cítricos de Chiriqui
- Faculty of Agriculture of the University of Panamá

ANNEX G
TAC PAPER ON RELATIONSHIPS BETWEEN CGIAR CENTRES AND NATIONAL RESEARCH SYSTEMS: KEY POINTS & QUESTIONS

The Technical Advisory Committee (TAC) of the Consultative Group on International Agricultural Research (CGIAR) recently prepared, at the CGIAR's request, a background paper on "Relationships between CGIAR Centres and National Research Systems" (CGIAR, 1991). This paper raises several points with implications for the programming of A.I.D. funding for the international agricultural research centers (IARCs), the regional agricultural research centers (RARCs), and the national agricultural research systems (NARS). The following cites points from that paper and raises questions having implications for A.I.D. decisionmaking on assistance options for Ag REE-strengthening in the LAC region.

Key Point #1: The TAC notes that CGIAR Centre (IARC) activities cannot be effective

> "unless there is a certain minimum capacity within the national system to do research, as well as to establish effective linkages both with the Centres and with local producers through the extension services. Where this minimum capacity is lacking, the Centres have sometimes collaborated with bilateral donors in the provision of research assistance [defined as including financial assistance, technical assistance, etc.], rather than face the frustration of not being able to transfer the benefits of their work." (p. 6)

But the TAC states that:

> Only the Group [CGIAR], itself, can determine the role it wishes to play in this whole area of activity [i.e., "issue of strengthening national research systems"]. In particular, it must enunciate its preferences for the extent to which the Centres it funds should become involved in direct support for national systems, and the ways in which they might do so." (p. 6)

Question #1: The TAC's reference to national agricultural research systems (NARS) lacking "minimum capacity" raises the question as to why the NARS lack capacity despite all the money, technical assistance, training, etc. expended? What, if anything, can the IARCs do about these factors--national policies, lack of funds, civil service systems, etc.?

Key Point #2: The TAC goes on to state that while "there is general recognition of the need for research assistance to national institutions to reinforce Centre activities, a recurring issue in the CGIAR has been the extent to which the Centres themselves should become involved in providing and administering it." (p. 9) Also, the TAC notes the role IARCs have played in creating research networks and that these networks have played a role in providing national programs access to development assistance. But the TAC notes:

> As a consequence, the increasing calls on the time of national scientists are not necessarily determined by their own national priorities. The driving force may be supply, rather than demand. Furthermore, active promotion of cooperative and contract research by the Centres might serve only to aggravate the problem....
>
> As far as cooperative networks are concerned, if they are to be successful and sustainable, there is no viable alternative to a demand-driven system in which the countries themselves define the problems and determine the priorities. It is the orchestration of CGIAR involvement in all these activities to which further thought must be given and appropriate action taken. (p. 13)

Finally, the TAC points out that the IARCs, including ISNAR, are playing or could play a role in providing research assistance (i.e., technical and/or financial assistance) aimed at strengthening national (public and/or private) agricultural research systems. However, the TAC clearly states that:

> If there is a desire to link Centre activities more closely to research assistance, an alternative approach would be to give more explicit recognition to this need, and to modify the structure of some or all of the Centres accordingly. (p. 6)

Question #2: In establishing ISNAR (International Service for National Agricultural Research), was the CGIAR's principal objective not that of "strengthening" NARS?

Key Point #3: The TAC proposes the possibility of establishing "a research assistance agency as a separate unit" at some or all of the IARCs **[see question #3 below]**. Such an agency would be controlled by the IARC's board but would have a separate budget and be "entirely self-funding, by charging appropriate overhead costs" **[see question #4 below]** on all research assistance it administered. Research assistance would be managed by "full-time specialists" **[see question #5 below]** rather than by international scientists on a part-time basis, as often happens at present.

> The research assistance unit could draw on Centre programme staff on a paid consultancy basis, thus maintaining the integrity of the core funding. Some restructuring of existing Centres along these lines would not be difficult. In some instances, it would amount to little more than re-organizing the units that already exist at some Centres, which currently operate under such titles as "international cooperation programmes." (p. 11-12)

A second option would be "collaboration with other organizations" (e.g., regional organizations such as FAO regional offices).

Question #3: Re the referenced "research assistance agency," would not such an agency be successful only by working in behalf of all the IARCs? Would each IARC's "research assistance agency" operate independently of other IARC research assistance agencies or would each IARC's research assistance agency be

affiliated with an overarching research assistance agency (e.g., ISNAR)? How would the agency address problems of NARS with commodities not represented by any IARC?

Question #4: Re the referenced "self-funding," where would the funding originate for direct, indirect, and overhead expenditures? To what extent is ISNAR's budget self-funded? How would a donor decide where a dollar invested would have the greatest impact--in IARCs, in RARCs, or in NARS?

Question #5: Re the referenced "full-time specialist," what would the specialist do and how would he do it? What would be the best qualifications for the specialist? How would the specialist relate to the IARC scientists? What would be the "status" of a specialist in research technical assistance in relation to IARC scientists? Would such a specialist operate more like an extension subject matter specialist who serves area-specific exten-sion agents?

Some would argue that asking IARCs to assume a major and/or leadership role for strengthening NARS distorts the whole purpose of the IARCS--to provide leadership in identifying and attacking major problems restricting efficient production of specific commodities. In this view, IARCs should stick to doing what they can do best, namely, helping NARS through: (a) literature; (b) germplasm; (c) training; (d) role models; and (e) influencing national policy makers.

Perhaps an expansion in ISNAR operations could most effectively address the issue, with ISNAR drawing consultants from IARCs, other research institutes, universities, private sector firms, etc. to meet the spectrum of policy, managerial, administrative, and technical problems of NARS. ISNAR also could refer specific projects to the World Bank, regional development banks, USAID, and other national development assistance programs.